EVALUATING THE INFLUENCE OF PAST GAMING EXPERIENCE ON LEARNER PREFERENCES AND MOTIVATION TO LEARN IN A MILITARY TRAINING ENVIRONMENT

THESIS

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Abstract

Millennial generation recruits are entering the Air Force and with them come their new attitudes and expectations. As a result, the leadership of the Air Education and Training Command (AETC) expressed a need for information on how to effectively train this new generation of recruits in their 2008 whitepaper. The purpose of this thesis was to begin to address this requirement by investigating the influence video gaming has on the learning preferences of trainees undergoing initial skills training at the 82nd Training Wing, Sheppard Air Force Base, Texas. A survey was administered and data was collected from 866 trainees. The survey included measures for age, video gaming experience, individual data format preferences (as measured by the Visual, Auditory, Read/Write, and Kinesthetic (VARK) questionnaire), goal orientation, motivation to learn, and performance self assessment ratings.

The results showed that video gaming experience was not significantly related to the subjects' preferred learning styles. However, correlations between the learning preferences and motivation to learn constructs indicated that none of the VARK category learners were significantly motivated in the current learning environment. Additionally, goal orientation was also shown to have a significant influence on motivation to learn. Therefore, increased goal orientation will have a profound influence on training motivation in the current training environment.

To my parents,
Who raised me and endeavored for my future

and

To my wife and kids who supported me every step of the way.
Thank you!

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Steven D. Yelverton

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EVALUATING THE INFLUENCE OF PAST GAMING EXPERIENCE ON LEARNER PREFERENCES AND MOTIVATION TO LEARN IN A MILITARY TRAINING ENVIRONMENT

1. Introduction

Prensky (2001b. p.1) states, "It is amazing to me how in all the hoopla and debate these days about the decline of education in the U.S. we ignore the most fundamental of its causes. Our students have changed radically. Today's students are no longer the people our educational system was designed to teach." This statement makes it abundantly clear that students of the modern digital world are somehow different from the students of the past and these changes are having an impact on the effectiveness of the educational system. As a result, there is an apparent need to increase training effectiveness by adapting the current educational systems and instruction approaches used to teach this new generation of learners. Prensky (2001b) further discusses the extent of this disconnect:

> A really big discontinuity has taken place. One might even call it a "singularity" - an event which changes things so fundamentally that there is absolutely no going back… biggest problem facing education today is that our Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language (p.1).

The new language mentioned by Prensky (2001b) is the language of technology. Members of the millennial generation, those born between 1980 and 2001 (Lessel, Mattison, & Werchan, 2008), have grown up in a digital world. Tapscott (1998, p.1) described this best, "Today's kids are so bathed in bits that they think it's all part of the

natural landscape. To them, digital technology is no more intimidating than a VCR or toaster." Hence, technologies once deemed revolutionary by baby boomers (computers, video-games, MP3 players, DVD players, etc.) are now viewed as fundamental parts of modern life. In fact, these technologies are so engrained in their lives that they have ceased to be seen as revolutionary advances.

1.1. Background

Technologies like televisions, computers, video-games, and MP3 players have seen an amazing proliferation and their influences are felt in every aspect of modern life. In many ways, the modern world is dependent on technology. Therefore, it should come as no surprise that members of the modern world have become accustomed to the constant bombardment of stimulation and information provided by these technologies. The influence of this constant flow of information is evident in the attitudes and preferences of children raised in this high-information environment. Prensky (2001a) presented a good example of this influence when he discussed the presentation format of the Bloomberg TV News. During these news broadcasts, the anchorperson is confined to one-quarter of the television screen. The remainder of the screen is filled with sports statistics, weather information, stock quotes, and headlines. This new format allows viewers to gain an unbelievable amount of information in a rather short amount of time. By changing their presentation format, Bloomsberg demonstrated a willingness to break from the established norm to accommodate a change in viewing demands. This raises the question: Are changes needed in other areas of life to maintain the attention of this new

generation? More specifically to this research effort, are changes needed in the Air Force education system?

1.2. Air Force Concern

Air Force leadership, within the Air Education and Training Command (AETC), are in complete agreement with Prensky. In January 2008, AETC's leadership released a whitepaper that states, "The Air Force must be able to understand the millennial generation and provide a training and education infrastructure that leverages their life-long exposure and aptitude with technology. As learning changes, so must our education and training approaches" (Lessel, Mattison, & Werchan, 2008, p. 7). Statements like this underscore the importance of effective education and training and highlight the concern Air Force leadership feels about the training of its future warriors. This research will examine a portion of this need.

Lessel (2008) discussed this requirement for a revolutionary training approach in a briefing given to the students and faculty at the Air Force Institute of Technology (AFIT). During the briefing, Lessel (2008) discussed how technology connectivity was going to be a major aspect of the lives of future Air Force workers, explained a virtual world initiative called MyBase, evaluated technology advancements and its influence on future Air Force operations, and explained increasing interest within the modern Air Force to transition from traditional classroom training to a more virtual training approach. He also discussed the seven imperatives that must be satisfied for AETC to successfully implement these needed advancements (Lessel, 2008).

1. A **common vision** for the future of education and training

2. A **strategic implementation plan** to achieve the vision
3. A **systematic approach** for inserting and integrating technology into education and training
4. A **enterprise-wide architecture** for education and training
5. An **investment strategy** for resourcing education and training
6. Closer **integration** of training and operations
7. A **commitment to start now**

Looney (2008, p.2), drove home the importance of adapting Air Force training in the introduction to the AETC whitepaper, "To maintain our position as the world's most respected and feared Air Force, we must carefully consider the future…We will need to recruit, train and educate Airmen with agile minds and cutting edge skills." Lessel's (2008) briefing and AETC's whitepaper highlight the importance of effective training and provide an excellent foundation for the establishment of a requirement to update the current training approaches within the Air Force. However, more information is needed to explain how the training environment should change and to identify a real-world solution to meet these future training requirements.

1.3. Problem Statement

As evidenced by the introduction, the new recruits of today are the Air Force leaders of tomorrow. Therefore, understanding how to reach these new learners is vital to the future success of the Air Force. However, evidence suggests that current training approaches may not be overly successful and that changes may be needed within the Air Force to address the new attitudes of the millennial generation learners (Hafer, 2006; Lessel, Mattison, & Werchan, 2008). This research examined the prevalence of video

gaming in the Airmen undergoing initial skills training at Sheppard AFB, evaluated the influence this gaming experience is having on the students' learning preferences, and investigated the impact these preferences have on motivation to learn in the current training environment.

1.4. Research Questions

Four research questions were used to guide this study. First, "Do video-games influence an individual's preferred learning style?" Three hypotheses were developed to answer this question.

H1: Increased age will result in lower level of video gaming experience.

H2: Increased exposure to video-games contributes to an increased preference for kinesthetic learning.

H3: Increased exposure to video-games contributes to a decreased tendency for a read/write learning preference.

The second research question was, "Does an individual's learning style influence motivation to learn in the current military training environment?" Two hypotheses were associated with this question.

H4: The current training environment will have a negative influence on kinesthetic learner's motivation to learn.

H5: Read/write learners are positively motivated to learn in the current training environment.

The third research question asked, "Does goal orientation influence motivation to learn?" Two hypotheses were developed to answer this question.

H6a: Goal orientation positively moderates the relationship between the kinesthetic learning style and motivation to learn.

H6b: Goal orientation positively moderates the relationship between the read/write learning style and motivation to learn.

Finally, the last research question asked, "What impact does motivation to learn have on performance confidence?" There was one hypothesis associated with this question.

H7: Motivation to learn is positively related to an individual's performance self-assessment.

1.5. Methodology

The primary methodology used for this research was a statistical evaluation of data collected in a survey of 866 students undergoing initial skills training with the 82nd Training Wing at Sheppard AFB, Texas. The data analysis included a factor analysis and investigation of the coefficient alpha of the motivation to learn and goal orientation survey measures for construct reliability; it also included correlation and linear regression evaluations to examine the validity of the research hypotheses. A detailed discussion on the survey development and execution process is given in Chapter 3. Lastly, all statistical evaluations were accomplished with the SPSS 16.0 and Microsoft Excel 2007 software packages.

1.6. Limitations and Assumptions

There are a number of limitations that bounded the results of this study. The first limitation was time. This thesis was completed during an 18-month program at the Air Force Institute of Technology, so only one run of the survey was possible. Therefore, the results of the study represent only a snapshot in time. Second, there was limited information available in the literature on training motivation in a military environment to establish the foundation for this research. The last limitation was a lack of generational

studies in the literature. While a wealth of millennial generation information is available, only a few of the sources discussed the research done to support their assertions.

In addition to limitations, two key assumptions were used to help structure this research effort. The survey data collected for this study was drawn from multiple training squadrons and training tracks to ensure an adequate sample size. Therefore, it was necessary to assume that a common training approach was used in all the courses surveyed. Second, it was assumed that the Visual, Aural, Read/write, and Kinesthetic (VARK) questionnaire used to measure the learning styles of the sample was a valid construct for measuring learning preferences.

1.7. Significance of Study

The future of the Air Force is dependent on well-trained Airman, capable of maintaining, operating, and engineering state-of-the-art technologies needed for the Air Force to maintain its position as the world's most dominate fighting force. For this to be possible, Air Force leadership must understand the learning preferences of the millennial generation and evaluate the effectiveness of the current training environment. To date, the learning preference studies have primarily focused on students in a high school or college training environment. The convenience of a sample is the most likely rationale, but this fact limits the relevance of the findings within a Department of Defense (DoD) military training environment. In addition to a unique sample set, this research utilizes the VARK questionnaire (Fleming, 2008) to examine if past gaming experience has an influence on an individual's data input and output preferences. The advantage of using the VARK questionnaire is that it provides a valuable measure of learning style based on

how the students prefer to learn, rather than indirectly predicting their learning strengths through a personality assessment.

1.8. Definition of Terms

Many terms used in this paper require clarification due to multiple meanings. Additionally, other terms are relatively new and require initial definition. Therefore, this section is devoted to explaining the use of these terms throughout the paper.

1) Generation: One of the most prevalent terms used throughout the thesis is generation. For this research, generation is a society-wide peer group, born over a period roughly the same length as the passage from youth to adulthood, which collectively possesses a common persona (Strauss & Howe, 2000).
2) Baby boomer generation: (1943-1960) Members of the baby boomer generation were born during or after World War II and raised in the era of extreme optimism, opportunity, and progress (Zemke, Raines, & Filipczak, 2000).
3) Generation X: (1965-1979) Born to the baby boomers and tend to be independent, self-motivated, and self-sufficient. They emphasis personal satisfaction rather than just working hard (Yu & Miller, 2005).
4) Millennial generation: (1980-2001) Members of the millennial generation were born to the baby boomer and early X generation and raised in a high-tech and neo-optimistic time (Zemke, Raines, & Filipczak, 2000). Interchangeable terms for millennial generation are Net-generation and digital generation.
5) Video-game: A mental contest, played with a computer according to certain rules for amusement, recreation, or winning a stake (Zyda, 2005).

6) Learning goal orientation: Dedication to developing competence by acquiring new skills, mastering novel situations, and learning from experience (Orvis, Horn, & Belanich, 2006).
7) Performance goal orientation: Focus on demonstrating and validating their competence by seeking good performance evaluations and avoiding negative ones (Dweck, 1986).
8) Motivation to learn: The direction, intensity, and persistence of learning-directed behavior in training contexts (Colquitt, LePine, & Noe, 2000).

1.9. Organization/Purpose of Remaining Chapters

The Air Force is facing a challenge. A new generation of learners is entering the service and the current training environment may not be adequate to get them properly trained and keep them motivated to learn. The following chapters provide a detailed description of the problem, explain the methods used for the research, and culminate with a discussion on the findings and recommendations of this research. This begins with a literature review. The literature reviewed serves three main purposes. First, it establishes the need for Air Force training reform to address the needs of the millennial generation learners entering the service. Second, it discusses the current research found in the literature and explains the information gaps filled by this research. Lastly, the literature review establishes a sound foundation for the remainder of the research effort by providing the background information needed for an understanding of the problem. Following the literature review, Chapter 3 explains the methodologies used for this research to include a discussion on the development of the research tool and an

explanation of the statistical analysis approaches used in the study. Chapter 4 provides the results of the statistical evaluation and a brief explanation of the results. The final chapter provides a detailed explanation of the conclusions drawn from the results and recommends some topics for future research.

2. Literature Review

This chapter provides a detailed overview of the relevant literature associated with this research effort. The first section establishes a requirement for Air Force training reform to address the needs of the millennial generation learners entering the service. Once the need is established, the next section briefly reviews some of the past research efforts done in the fields of learning preferences and classroom motivation. This discussion includes a brief explanation of the purposes of the research projects, an account of the research methodologies, and an explanation of the overall findings of the studies. Next, the focus of the literature review shifts and the remaining sections provide background information needed to develop a firm understanding of the current situation. Therefore, the third section begins with a discussion of how the modern world has changed and how these changes are influencing the lives, attitudes, and preferences of the millennial generation. This begins with a discussion of some of the recent technological innovations that have had a disruptive impact on modern society and the impacts these innovations are having on the children of the modern age. The final section of the literature review concentrates on the problems facing the academic community: maintaining the attention of and teaching millennial generation students.

2.1. Research Introduction

Training is a critical aspect of Air Force life. From day one, enlisted recruits are thrust into a world of 24-hour training in Basic Military Training (BMT). During BMT, the recruits are taught the fundamental elements of military life such as rank structure,

chain of command, military bearing, and military customs and courtesies. BMT also places great emphasis on weapons training, war-fighting, combat aid, chemical/biological weapons defense, and remote deployment skills to convert civilian individuals into a military team (Powers, 2009). Immediately following graduation from BMT, the recruits are sent to initial skills training to learn how to perform the duties of their new career field (i.e, Air Force Specialty Code (AFSC)). The intent of intial skills training is to give the new recruits a basic understanding of the expectations and demands of their new career field. Once initial skills training is completed, Airmen have a general understanding of their duty responsiblities but require additional periodic training to continue progressing throughout their careers. With all this focus on training, it is imperative that the Air Force is efficient in both the training content and training approaches used to reach the present and future recruits entering the service. As Looney (2008, p.2) stated, "The young men and women who will lead our Air Force in the future have been living in a digital world their entire lives and are better prepared than any other generation to operate in this environment. It is imperative their needs and expectations inform our approach to education and training." This statement clearly indicates that the Air Education and Training Command (AETC) is keenly interested in having a firm understanding of how to best train the millennial generation recruits entering the Air Force.

2.2. Past Academic Research

The effective training of new recruits has been the topic of military concern for years. In recent years, the use of technologies in the training environment has become the topic of research. The America's Army video-game is a good example of how

technology is creeping into the military training. The America's Army video-game, the brain child of Colonel Casey Wardynski, was originally conceived as a recruiting tool (Quinn, 2007). However, the game has evolved into a training tool and is now used to train explosives ordnance disposal soldiers how to operate robotic devices and Green Berets cultural sensitivity (Quinn, 2007).

As a result of this increased use of the software, the U.S. Army Research Institute for Behavioral and Social Sciences conducted research in 2005 to study the impact that prior video gaming experience and computer self-efficacy had on learner outcomes within a game-based training environment. Approximately 1,100 subjects underwent a four-day training exercise using the America's Army multiplayer video-game. The training began with a single-player tutorial to familiarize the subjects with game-specific tasks. This tutorial was followed with a multi-player game in which participants formed teams and conducted collaborative missions. Once the training period was completed, the subjects were asked to voluntarily complete an online questionnaire. Of the 1,100 participants in the training, a sample of 414 volunteered to complete the survey. The results indicated that high levels of computer self-efficacy and prior video-game experience were predictive of less difficulty using the game interface and greater team cohesion, training satisfaction, and training motivation (Orvis, Orvis, Belanich, & Mullin, 2005). This indicates that game-based training can be effective given the correct background and experience. However, the study lacked information about the subjects' learning preferences and the effects these preferences had on motivation in a classroom setting.

In 2006, the U.S. Army Research Institute for Behavioral and Social Sciences conducted a follow-up investigation to the study by Orvis, Orvis, Belanich, and Mullin (2005). This updated research examined prior video-game experience, video-game self-efficacy, and goal orientation as antecedents that maximize trainee motivation, as well as other learner choices and outcomes, in personal computer game-based training (Orvis, Horn, & Belanich, 2006). The data collection methodology involved a pre-training and post-training questionnaire. Upon completion of the pre-training questionnaire, 364 participants played the America's Army video-game. As with the 2005 study, the training began with a single-player session to introduce game specific tasks, followed by a multi-player game in which participants formed small teams to conduct several collaborative missions. Once the training was completed, 80 of the particpants completed the post-training questionnaire. The results of the research showed that the participants' video-game self-efficacy and level of goal orientation had a positive impact on trainee motivation, trainee satisfaction, ease of use of game interface, team cohesion, and metacognitive strategies used during training. Self-efficacy and goal orientation characteristics also influenced the amount of time the trainees spent engaged in the training game. As with the initial research, the results of this follow-up research provided useful information to support the use of video-game-based training (Orvis, Horn, & Belanich, 2006). However, the research did not address the influence of learner preference on training motivation or the influence that past video gaming experience has on the participants' preferred learning styles.

Student learning styles have also been the subject of considerable research. For instance, Leuthold (1999) examined the influence a person's learning style had on their

attitude toward computer-based instruction. The sample group included 40 research students from an undergraduate economics class, and the assessment was based on the Gregorc Learning Style Delineator to determine their basic learning style as concrete or abstract and sequential or random. Additionally, the subjects were surveyed as to their attitudes towards the computer-based aspects of the class and correlation coefficients were computed to see if certain learning styles were associated with positive attitudes towards computer instruction. The results demonstrated that students with abstract-sequential learning styles were more apt to use computer-based instructional techniques more frequently and prefer them to traditional instructional techniques when compared with students whose learning styles were concrete-random. The results of this study illustrate that learner preferences do seem to influence an individual's motivation towards game-based training (Leuthold, 1999).

Another learning style study was conducted by Boatman, Courtney, and Lee (2005). This research used the Visual, Aural, Read/Write, and Kinesthetic (VARK) inventory to identify the preferred learning style of the participants. Conducted during the Fall and Spring semesters of the 2005/2006 academic year, the VARK questionnaire was administered to a representative sample of 211 students during the first week of each semester. At the start of the course, the Test of Understanding College Economics (TUCE) was administered to establish the participants' pre-training base of knowledge and re-administered once the training was complete to establish a post-training knowledge base. The change in scores was used to measure the level of acheivement in the introductory economics courses. The results of the study indicated that a strong visual learning preference positively influenced student performance in introductory

economics classes (Boatman, Courtney, & Lee, 2005). This suggest that the learner preferences identified with the VARK questionnaire have a direct influence on the student performance and imply that variations in teaching strategies can lead to improved training effectiveness.

In further VARK-based research, Pahl and Byrne (2002) investigated the relationship between individual learning styles and effective online multimedia learning sources. The researcher used the VARK questionnaire and the Index of Learning Styles (ILS) to identify the preferred learning styles of a convenience sample of students from two Electrical Science classes totaling 31 subjects (16 from class 1, 15 from class 2). The online multimedia learning sources were placed in an online learning environment called WebCT. The online training environment was delivered in a self-directed and self-paced manner and included different combinations of communication formats, including text, video, audio, images, graphics, and animation. Additionally, both classes were given two hours of Electrical Science training by the same lecturer at a similar pace using the same teaching methods. The results of the experiment indicate a significant relationship between learning style and multimedia preference for the learning preferences identified by the VARK. However, no significant relationship existed between the learning styles identified by the ILS and multimedia preferences. Ancillary findings showed that 35.48% of the sample group were identified as Kinesthetic learners, 16.25% were strong in more than one style, 16.12% were strongly Aural, 9.65% were Read/Write, and only 3.22% were visual learners. Byrne and Pahl (2002) hypothesize that the relationship between the VARK learning styles and multimedia may exist because of the high proportion of students (35.48%) selecting interactivity as their preferred multimedia

learning experience. The results of this study indicate that the learner categories measured by the VARK questionnaire are valid indicators of an individual's data input and output preferences.

2.3. Millennial Background

For the first time in history, a generation is being raised and growing up in a world surrounded by digital media. Technologies like television, digital music players, digital video players, and personal home computers are dominating their lives. As a result, the children of the modern age have becoming digital savants. In fact, Prensky (2001c) states:

> Children today are being socialized in a way that is vastly different from their parents…over 10,000 hours playing videogames, over 200,000 emails and instant messages sent and received; over 10,000 hours talking on digital cell phones; over 20,000 hours watching TV (a high percentage fast speed MTV), over 500,000 commercials seen—all before the kids leave college. And, maybe, *at the very most,* 5,000 hours of book reading (p.1).

Clearly, the millennial generation is spending far more time under the influence of the digital world and, as a result, they have become completely attuned with the technologies and the languages of this new world, so much so that Prensky (2001c) coined the phrases "digital native" to describe this mastery and "digital immigrants" to describe the older generations. Prensky (2001b) states that:

> Our students today are all "native speakers" of the digital language of computers, video-games, and the Internet…Those of us who were not born into the digital world but have, at some point later in our lives, become fascinated by and adopted many or most of the aspects of the new technology are, and always will be compared to them, Digital Immigrants.
> The importance of the distinction is this: As Digital Immigrants learn… to adapt to their environment, they always retain, to some degree, their "accent,"…The "digital immigrant accent" can be seen in such things as turning to the Internet for information second rather than first, or in reading the manual for a program

> rather than assuming that the program itself will teach us to use it. Today's older folk were "socialized" differently from their kids, and are now in the process of learning a new language. And a language learned later in life, scientists tell us, goes into a different part of the brain (p.1).

Tapscott (1998) also identified and discussed this mastery of digital technology when he stated:

> For the first time in history, children are more comfortable, knowledgeable, and literate than their parents about an innovation (computers, and digital technologies) central to society. And it is through the use of the digital media that the N-Generation will develop and superimpose its culture on the rest of society (p.1).

This familiarity with all things digital has resulted in a generation that works, plays, and interacts very differently than the generations that preceded them. These differences should not be too surprising given this generation is the first to use e-mail, instant messaging, and cell phones since childhood and adolescence (Tyler, 2007). In addition to these digital mediums, another digital innovation that has had a profound impact on the lives and attitudes of the members of the millennial generation is video-games.

Pong was released in 1972 and was the first widely successful arcade style video-game (Miller, 2005). In the first year of its release, approximately 19,000 Pong arcade games were sold (Winter, 2008) and "this game truly launched the electronic gaming revolution; from 1972 through 1976, you couldn't go to a pub or arcade without finding a long line at the PONG machine" (Miller, 2005, p. 1). From these humble beginnings came a thriving video-game industry. In 2004, "digital gaming was a $10 billion per year industry...and nearly as many digital games were sold as there are people in the United States (248 million games vs. 293.6 million residents)" (Van Eck, 2006, p. 17). In 2007,

video-game software sales within the United States grew six percent to $9.5 billion (more than tripling industry software sales since 1996) (ESA, 2008).

Given this information, it is logical to assume that individuals growing up in this environment would adapt to a high degree of digital stimulation. Furthermore, when generational changes occur, they tend to affect the systems established to meet the needs of the preceding generations. The influence is even more ground-shaking for the millennials, given the fact that the millennial generation numbers approximately 80 million strong in the United States alone (Tyler, 2007). Therefore, it is vitally important to understand how this continuous exposure to digital media and video gaming is affecting the minds, attitudes, and preferences of the members of the millennial generation.

The Air Force is keenly aware of the challenges posed by these new attitudes and interested in what these changes might mean in the near future. In 2008, the leadership of the Air Education and Training Command (AETC) stated, “the ushering in of the millennial generation, will require a novel approach to how the Air Force recruits and develops its future Airmen” (Lessel, Mattison, & Werchan, 2008, p. 7). The authors further stated that maintaining an all-volunteer force will mean great competition for the skilled labor required to meet the Air Force’s accession requirements because only 27% of today’s American youth currently qualify for Air Force duty (Lessel, Mattison, & Werchan, 2008).

2.3.1. Getting to Know the Millennials

There is an old adage, "You shouldn't judge someone until you've walked a mile in their shoes." So in order to get to know the millennial generation, it is important to

understand some of the influences in their lives. According to Twenge (2001), 50% of an individual's personality is believed to be influenced by environmental factors exteral of family. The other 50% of their character and behavior is believed to be a result of genetics and family environment (Jones, Jo, & Martin, 2007). Since family background has such an apparent influence on personality, it is imperative to first learn a little about the family environments that surround the millennials.

Following World War II, there was a population explosion within the United States (U.S. Department of Health and Human Services, 2009) and the resulting generation is often referred to as the baby boomers. As Figure 1 shows, the birth rate in the U.S. increased after World War II and lasted until the 1960s. The baby boomers "lived through the Vietnam war, the Civil Rights Movement, the women's movement, the OPEC oil embargo, the Cold War, Woodstock, the recession, and the divorce courtroom…Such events shaped bady boomers into optimistic idealists, who pushed for change" (Pastorino, 2006, p. 17). Once the boomers came of age and started raising families, they produced both the X and millennial generations. The generational divide between the X and millennial generations resulted from some members of the baby boomer generation having children earlier in their adult life. These individuals produced the X generation. However, most of the boomers decided to delay childbirth (thus the much larger millennial generation) (Strauss & Howe, 2000). As a result of delaying parenthood, "the average age for mothers was 27- bringing more maturity and emotional stability to the role of caregiver" (Busch, 2005, p. 8). As a result, the members of the millennial generation were subject to intense pressure to succeed, worry, and wonder from parents, pollsters, pundits, and politicians. This shift in the focus of the adults in

their lives led to a change in the persona of the members of the generation (Strauss & Howe, 2000).

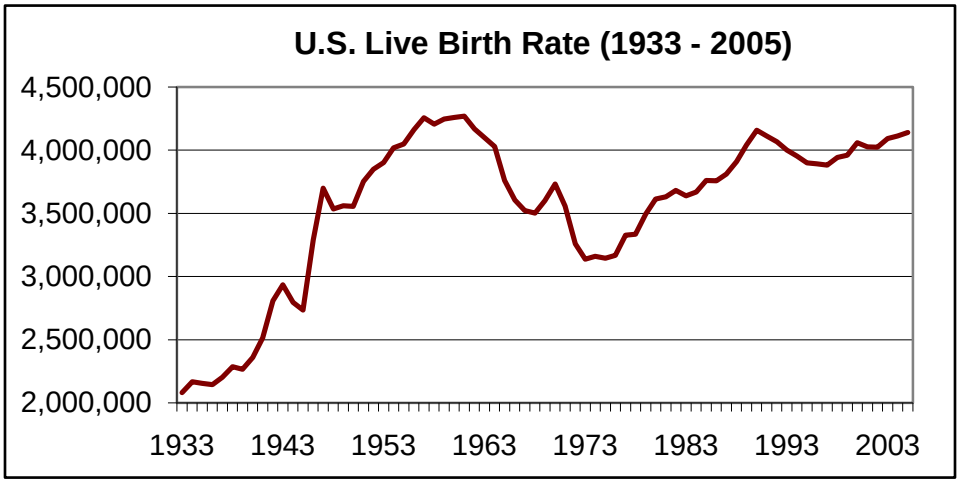


Figure 1. U.S. Live Birth Rate (1933-2005) (U.S. Department of Health and Human Services, 2009)

It is clear that the millennial generation is rising. While the youngest members are still in elementary school, the eldest members of the generation are fast approaching 30, graduating from college, and entering the workforce, and the good news is this generation is possibly poised to become the next great generation (Strauss & Howe, 2000). As a general rule, this generation can be characterized as better educated, more affluent, and more ethnically diverse. Furthermore, a review of the literature indicates that there are several common traits expressed by the members of this generation.

2.3.2. Behavioral Traits

Sweeney (2006, p.2) noted that, "There are a number of Millennial behaviors that are different in statistically significant ways and will impact all of society." The members of the millenial generation are result-oriented, multi-tasking, digital natives, who live well-balanced lives and are accustomed to a nomadic style of communication (Sweeney, 2006). Since further explanation is needed at this point, the remainder of this section discusses some of the more academically accepted traits: family-focused, impatient/results oriented, multi-tasking, nomadic communicators, team orientation, digital excellence, and gamers.

2.3.2.1. Family-Focused

From the late 1960s into the early 1980s, the nation passed through a period when many aspects of life became less protective of small children (Strauss, 2005; Sweeney, 2006). However, the decade of the 1980s saw the parental concentration of the nation shift back to the children of the millennial generation. This renewed family focus resulted in the millennial generation growing up in a family-dominated era (Busch, 2005). Thielfoldt and Scheef (2004, p.2) stated, "Members of this (millennial) generation are being raised at the most child-centric time in our history." Additionally, this generation has seen their fathers taking a renewed interest in their lives and the average age of mothers has increased to 27, which has brought more maturity and emotional stability to the role of care giver (Busch, 2005). As a result of this increased family focus, several character traits have emerged within the members of the millennial generation.

Research shows that one of the key traits of the millennial generation is that they are especially close to their families. One study found that 85 percent of the millennials interviewed personally ranked family as their first or second priority in life (Sandfort & Haworth, 2003). What this means to an organization is that the millennials will require a balance between work and family. They do not want their lives dominated by work, so long gone are the 60 to 70-hour work weeks of the baby boomers. This generation is demanding 40 to 50 hours a week (Busch, 2005; Sweeney, 2006). Tyler (2007, p.5) quoted Bramlett when she wrote "work/life balance is important to this generation, and it shouldn't matter why they want the time off." Basically, "the millennials want social equality and enough income to live comfortably. But they don't want their lives dominated by work" (Niedermier, 2004, p. 1).

In addition to wanting a balanced life, and since their parents played such an active role in their lives, the members of the millennial generation have come to view their parents as friends and trusted confidants. According to Moore (2007, p.6), "Millennial generation students have come to trust their parents. In fact, some studies state that over 85 percent of Millennials trust their parents, with most considering their parents heroes; contrast that to Baby Boomers, 40 percent of whom thought they'd be better off without their parents." Given this special bond, the millennial generation also trusts their parents' opinions and are prone to bounce ideas and questions off of them to gain their perspective (Moore, 2007).

2.3.2.2. Impatient/Results-Oriented

In 1984, the federal "Nation at Risk" report on education brought to light the failing United States public education system and parents began to focus considerable

attention on their children's education (Busch, 2005). During this time, parent-teacher organizations became popular as parents began to actively manage their children's education (Busch, 2005). As a result, the millennials became pragmatic decision-makers who demand efficiency and have little patience for wasting time. The impatience of the millennials generation is well documented in the literature. Sweeney (2006, p.3) states that "millennials by their own admission, have no tolerance for delay" and "their desire for speed and efficiency cannot be overestimated." Tyler (2007, p.7) further supported this idea when she quoted Twenge, "They're used to instant gratification. They tend to be impatient and want things yesterday...the advantage is that, in their impatience, they may become more efficient, but the disadvantage is that they may not have the patience to work through a complex problem." Oblinger (2007, p.4) further described this when she said, "Having grown up in a customer-service culture, today's students have a strong demand for immediacy and little tolerance for delays." Green (2007, p.5) echoed this sentiment when he said, "the millennial student is a technology veteran and their expectations are high and their attention is sharp but brief." Statements like these clearly show that the millennials have little patience for inefficiencies and demand results.

The increased family focus also led to an elevation in the expectations placed on the youth of this generation, which resulted in them "feeling added pressure to succeed. Success is being bred into them every step of the way" (Busch, 2005, p. 9). Howe and Strauss (2003, p.1) described this results orientation as, "Their focus is more on the world of achievement rather than personal development." A quote by Murray summed it best when he said, "Success must be attained; failure avoided. And so, the children grow up

accustomed to achieving, expecting it of themselves, finding the avenues that permit it" (Busch, 2005, p. 9).

2.3.2.3. Multitaskers

A third characteristic of the Millennial generation is that they are prolific and efficient multitaskers. This generation is known for its ability to simultaneously email, instant message, surf the web, and talk on their cell phones (Carlson, 2005; Donald, 2005; Garcia, 2007; Kumar, Klatt, Conran, Pillinger, & Siew, 2004). As digital natives, they are accustomed to rapidly receiving and processing information so they can effectively listen to music, work on the computer, and watch television simultaneously (Coates, 2007; Lessel, Mattison, & Werchan, 2008; Oblinger & Oblinger, 2005). Sweeney (2006) and Howe and Strauss (2003) agree that the main reason the millennials excel at multitasking is because they see this practice as an efficient and practical use of their time. Epstein stated that, "For today's young people, multitasking is as natural as eating" (Tyler, 2007, p. 6). This multitasking tendency is also seen in the business world as these millennials are observed having telephone conversations while working on their computers and reviewing their emails (Prensky, 2001a). This raises the question, “What makes them such effective multitaskers?” Kaye, Scheff, and Thielfoldt (2003, p.29) stated that, “They’re good at multitasking, as they’ve juggled sports, school, and social interests as children, they’re used to tackling multiple tasks with equal energy.”

2.3.2.4. Nomadic Communication Style

The modern world has become increasingly mobile. Digital music (MP3) players allow individuals to carry their entire music collection in a convenient, pocket-size player. However, the innovation with perhaps the biggest influence on the portability of

modern society is the invention of the cellular phone. On October 13, 1983, the president of Ameritech Mobile Communications placed the first ever commerical cell phone call to the nephew of Alexander Graham Bell and a year later, Ameritech mobile had 12,000 subscribers. As of June 2008, there are an estimated 262.7 million cellular subscribers in the United States (Reardon, 2008). In 1983, the first call was placed on a Motorola DynaTAC "brick" headset that retailed for $3,995 and weighed 2.5 pounds (Reardon, 2008). Today, the 16 gigabyte version of the Apple IPhone retailes for $299 and allows owners to wirelessly search the internet, get turn-by-turn directions from the Global Positioning System (GPS), take digital photos, record digital video clips, send instant messages, listen to MP3s, and much, much, more (Apple, 2009). Add the creation of the laptop computer to the mix and you have the ingredients for totally mobile communication. As a result, the youth of America have come to embrace and demand portability to accommodate their nomadic communication style. Several authors have noticed and written about this proliferation of mobile communication. Carlson (2005) stated that the millennials are known to carry an arsenal of electronic devices and the more portable the better (Carlson, 2005; McMahon & Pospisil, 2005; Nelson, Kift, & Harper, 2005; Sweeney, 2006). Strauss (2005, p.3) appears to agree, "Millennials expect their technology to be mobile and to be able to get access anywhere, anytime they want." As a result of this portabilty, the millennials are in constant connection with their friends, families, and business associates, which feeds directly into their need for collaboration.

2.3.2.5. Collaborative

"None of us is as smart as all of us," this phrase is on the wall of the 77th Aeronautical Systems Groups Commander's conference room. The intention of the sign

is to remind everyone that teamwork is vital in business. Today, this sign could serve as a battle cry for the millennial generation. There is little argument in the current literature that an important trait of the millennials is the focus on team, so much so that Moore (2007) describes them as the "leave no one behind" generation. This sense of teamwork has been facilitated on the soccer fields, in classrooms, and at home (Busch, 2005; Howe & Strauss, 2000; Moore, 2007). It is important to note that not all millennials prefer collaboration. However, Sweeney (2006) stated that these members also know how and when to work with other people to gain a practical advantage. Their preference for collaboration and teamwork is also seen in their private lives. According to the literature, millennials band together to date and socialize rather than pairing off like past generations (Kaye, Scheef, & Thielfoldt, 2003). Perhaps one of the most telling statements found in the literature was made by Howe and Strauss (2003) when they stated that the millennials are so group-oriented that, "They may sacrifice their own identity to be part of the team." If these statements are to be believed, then organizations had better take notice because the days of office cubicles separating each individual may be lost in favor of a more open workplace environment designed to embrace teamwork.

2.3.2.6. Digital Excellence

The next attribute discussed is perhaps the most telling of this generation. Wallis (2006, p.3) stated, "Every generation of adults sees new technology…And every generation of teenagers embraces the freedoms and possibilities wrought by technology in ways that shock the elders." Hence, it is no surprise that the members of the millennial generation are masters of digital technologies and computers. In fact, technological mastery lead Prensky (2001) to label them as "digital natives" and technically literate like

no one else (Kaye, Scheef, & Thielfoldt, 2003; Cobcroft, Towers, Smith, & Bruns, 2006). The fact is that this generation is the first to grow up in a world completely surrounded by digitial technology likes computers, video-games, television, DVD players, and MP3 players. These technologies have always been a part of their natural landscape so they have adapted to this landscape and embraced it. As a result, they are much more comfortable with these technologies and have developed a much higher level of understanding than their baby boomer parents. Alch (2000) put it best when he stated:

> Having grown up with technology in school and at home, they are infinitely more comfortable with it than their parents are. Unlike television, the Internet is something they feel control over. A revolution in telecommunications has made instant global interaction possible. Benefiting from a large technology-knowledge gap between themselves and their parents, members of the "Net generation" represent a potentially more powerful and influential cohort than any previous generation (p. 1).

Today, it is not uncommon to see parents turning to their children for help with setting up their home networks and load music on their MP3 players. Given that the world is going digital, this type of knowledge gives this generation an advantage over the older generations.

Another aspect of the technologically savvy nature of the millennial generation is that they are enormous consumers of information with the ability to locate details on anything within seconds (Tyler, 2007). Given this fact, the organizational benefits gained from employing the millennials are obvious. However, the demands are also great. As mentioned, the millennials tend to be impatient with a lack of technological sophistication in others, so organizations, instructors, and training classes that fail to keep up can expect to have problems meeting students' expectations for connectivity (Taylor, 2004). Lastly, in addition to being born into the digital world, the millennials' technical

skills have been continually refined and improved as a result of their experience with highly complex systems and the complicated intricacies of video-games (Busch, 2005). This has resulted in a generation that is capable of quickly adapting to an increased use of computers and changes in internet services (Sweeney, 2006).

It is important to note that while there is considerable support within the literature for the assertion that the children of the millennial generation are technically savvy like no other, some feel that the claim is overstated. For example, a researcher in Australia found, in a study of 2,120 first year college students, a "lack of homogeneity in the incoming first year student population with regards to technology and a potential 'digital divide' between students within a cohort of a single year level" (Kennedy, Judd, Churchward, & Gray, 2008, p. 10). For example, the researchers found that a majority of the students in the study expressed an interest in downloading MP3s to assist with their studies, almost 40% of the students were uncertain about or did not wish to use this form of technology (Kennedy, Judd, Churchward, & Gray, 2008). The results of this study indicate that not all millennials are "digital natives" and highlights the need for additional information on millennial generation students.

The literature makes it clear that technology and computers are playing a central role in the modern world, and indications are that their use will continue to grow. The literature also shows that the children of the millennial generation are the ones best suited for working with these technologies. Therefore, a firm understanding of how to motivate and educate this generation is vital. The next section will examine some of the educational challenges imposed on training institutions and the Air Force by the millennials.

2.4. Educating the Millennials

The millennial generation is growing up in a time unlike any other. Their world is driven by technology and they are under a constant bombardment of digital stimulation. Additionally, this generation is growing up in a time of unprecedented change and choice. No longer do they have to listen to the radio and hope for the Disc Jockey to play their favorite songs. With their MP3 players, they now build playlists that contain only the music they want to hear. Thanks to computers and Digital Video Recorders (DVR), they can choose exactly what they want to see and when they want to see it. Additionally, by DVRing their favorite shows, they have the ability to pass over commercials, thus allowing them to live in a state of nonstop engagement and customization.

However, there is one area of life where they have little to no say over their environment and that is school. Prensky (2005, p.62) states, "Life for today's kids may be a lot of things—including stressful—but it's certainly not unengaging. Except in school. And there it is so boring that the kids, used to this other life, just can't stand it." Prensky's (2005) comment makes it clear that he feels the education system should cater to this new generation, and he is not alone in his views. Sweeney stated that instructers need to, "Make blogs, iPods, and video-games part of your pedagogy. And learn to accept divided attention spans. A new generation of students has arrived -- and sorry, but they might not want to hear you lecture for an hour" (Carlson, 2005, p. 1). Further, Sweeney and other observers "feel that the millennials expect to choose…what, where, and how they learn. To meet the demands of these new students…colleges must rethink how they operate" (Carlson, 2005, p. 4).

Further support for these assertions came from the National Institute of Media and Family, which calculated that 80 percent of all millennials have a computer in their home and of those, nearly 92 percent have regular access to video-games (Hafer, 2006). Hafer (2006, p.18) further stated, "The billion-dollar gaming business knows that games packed with high-speed graphics and adrenalin rushes are the most popular. Thus, in a society of kids conditioned to constant, ever-changing excitement, there is no way common, mundane work will satisfy them."

While Prensky (2005), Carlson (2005), and Hafer (2006) agree that education reform is needed, not all researchers agree that this reform is necessary. These writers feel that it is not the school's responsibility to cater to the students. It is the student's responsibility to be disciplined and accomplish the work required regardless of the training environment. Carlson (2005) asks, "Should universities cater to the tech-savvy millennial generation?" While some support the idea, others feel strongly that no change is needed. For instance, consider the view of Gorman, the Dean of Library Services at California State University at Fresno and president of the American Library Association. He cautions against generalizations across generations; in his opinion, higher education should not have to pander to the whims of their students (Carlson, 2005). Baron, a Linguistics professor at American University, is in complete agreement: "It is very common to hear people say, here's the Millennial or the digital generation, and we have to figure out how they learn. Poppycock. We get to mold how they learn." It is her belief that too much catering to meet the students' expectations will ultimately kill higher education (Carlson, 2005, p. 2).

The views of Gorman and Baron highlight an attitude within academia that students are responsible for learning course materials regardless of the training environment. This view may suffice in a prominent scholastic environment, where the students gain a sense of prestige from graduating from the university; however, it may not be appropriate within a high-demand environment, like the one facing the Air Force, where only 27% of the millennial generation qualifies for duty. In environments with such a small pool of eligible candidates, "the Air Force must be able to understand the millennial generation and provide a training and education infrastructure that leverages their lifelong exposure and aptitude with technology. As learning changes, so must our education and training approaches" (Lessel, Mattison, & Werchan, 2008, p. 7). Given the importance of understanding this generation, next is a discussion on some of the prevalent learning traits identified within this generation.

In 1981, Secretary of Education T.H. Bell created the National Commission on Excellence in Education. The commission was developed to address public concern that, "something is seriously remiss in our educational system" (National Commission on Excellence in Education, 1983, p. 1). This statement shows that education reform has been a concern for over 20 years in the U.S. However, a quote from Shaffer, Squire, Halverson, and Gee (2004) shows that the need for education reform has been around for much longer.

> A century ago, John Dewey argued that schools are built on a fact fetish, and it is still true today. The fact fetish views any area of learning…as a body of facts or information. The measure of good teaching and learning is the extent to which students can answer questions about these facts on tests (p. 7).

For past generations, this form of teaching was sufficient. However, the millennial generation learners are fundamentally distinct from past generations and this type of learning environment may not be sufficient. In fact, Oblinger and Oblinger (2005, p.1.2) stated that, "We probably speak for most educators when we say that not only do we not really understand our children, but we don't really understand our students the way we'd like to." Robert (2005, p.2) further supports this need for change, "It's no longer viable to gather a group of learners in a classroom for multi-day training programs. Learning needs to occur in smaller chunks of time, and, at least to some degree, be available at varying times." These statements raise the question, what makes this demographic group different from past generations of learners? Prensky (2001) answered this question by stating that the cognitive styles of these learners have changed in 10 fundmental ways.

1) Twitch speed vs conventional speed: The games generation has far more experience at processing information more quickly than past generations and is therefore better at it.

2) Parallel processing vs linear processing: Many millennials have grown up multitasking, so they feel more comfortable than other generations doing more than one thing at a time.

3) Random access vs step-by-step: Millennials are accustomed to receiving bits and pieces of information from multipe sources. This less sequential information structure has increased their ability to make connections.

4) Graphics first vs text first: The role of text is to expound on something that was first experienced graphically.

5) Connected vs stand-alone: The millennials are accustomed to constant connectivity, which has influenced how they seek information and solve problems.

6) Active vs passive: Millennials prefer a more active, learn-by-doing approach to learning. For example, they are less likely to read manuals to learn new software than past generations.

7) Play vs work: Millennials tend to view play as work and they have a playful attitude towards work.

8) Payoff vs patience: The millennials have become accustomed to immediate reward and feedback. What you do determines what you get, and what you get is worth the effort you put in.

9) Fantasy vs reality: Increased desire for fantasy over reality.

10) Technology-as-friend vs technology-as-foe: Older generations tend to view technology as something to be feared, tolerated, or at best harnessed for a specific purpose. The millennials view technology as a trusted friend and something that touches every aspect of life.

While these 10 congitive styles are the result of the work done by Prensky (2001), his claims support the behavioral traits mentioned earlier in the literature review. Therefore, the validity of the claims that the millennial generation are different from past generations seem reasonable and changes may be needed within academia to reach this generation.

3. Methodology

The primary purpose for this study was to investigate the influence that video gaming experience has on an individual's preferred learning styles and the influence these learning styles have on the subject's motivation to learn. To accomplish these goals, a literature review was conducted to identify possible constructs relevant to this research effort. This chapter discusses the development of the research model, the approach taken to obtain an adequate sampling of the population, the creation of the survey instrument, and the procedures used to analyze the data.

3.1. Model Development

The literature supports the assertion that the children of the millennial generation are different from previous generations and these differences are posing an issue to the training and education of this new generation of learners. As a result, the students of the millennial generation have been the subject of considerable research in academia and the information gained from this past research provided a sound foundation for this study (Boatman, Courtney, & Lee, 2005; Byrne & Pahl, 2002; Garcia, 2007; Oblinger & Oblinger, 2005; Sandfort & Haworth, 2003). However, integration of this abundance of material into a concise model required consideration of the relevance of the millennial trait information and the impacts these traits are having in training environments. The goal of this research effort was to synthesize this information into a straightforward model that adequately represents the key factors associated with training the new recruits entering the Air Force.

The model was structured in accordance with the research hypotheses to give a graphical representation of the predicted direction of the relationships between the study's constructs. The constructs include age, video-game experience, preferred learning style (e.g., kinesthetic and read/write as measures by the VARK questionnaire), goal orientation, motivation to learn, and performance assessment. The resulting model is shown in Figure 2.

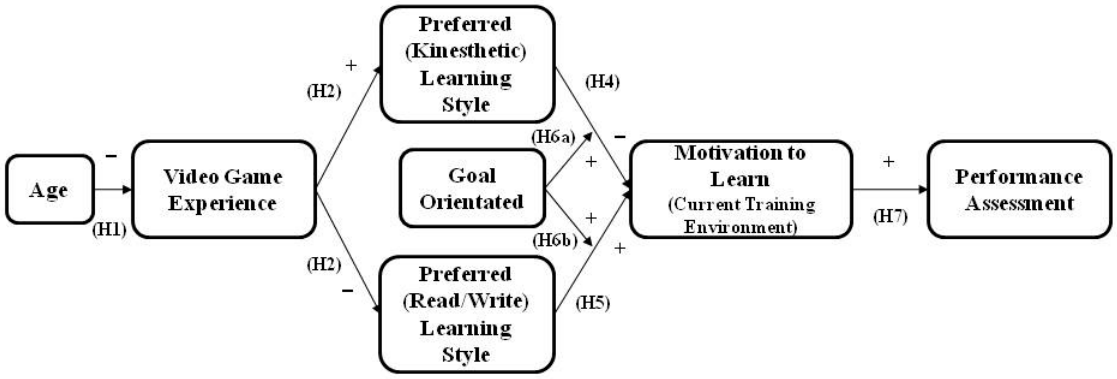


Figure 2. Research Construct Model

The elements to the left of any given arrow are considered the independent variables and believed to have a direct influence on the elements to the right of the arrow. The negative and positive signs depict the direction of the relationship between the elements. For example, the negative sign between the age and video-game experience constructs indicate that older subjects will have less gaming experience than younger subjects. The goal oriented construct depicts a moderating relationship between the subject's preferred learning style and their motivation to learn in the current training

environment. The remainder of this section will discuss the research hypotheses and associated constructs.

3.2.1. Hypothesis 1 (Age and video gaming)

The influence age has on the time spent playing video-games is the first relationship investigated in the research model. One of the more common assertions in the literature was that the millennials think and process information differently than past generations as a result of the interactive/high information environment of the modern world (Prensky, 2001a; Oblinger & Oblinger, 2005), and video-games are an important part of this environment. Therefore, it was theorized that the millennials would be more likely to have an extensive video gaming background than the older members of the sample. To investigate this relationship, single question measures were developed for both the age and video gaming constructs. For age, "What is your current age?" (in years) was used to collect this data. The video gaming experience was collected by asking, "In the past year, on average, how many hours per week (including weekends) have you spent playing any type (PC-based, Nintendo, Playstation, arcade) of videogame?" By correlating the data gathered from these two measures, the researcher was able to determine the extent of game play within the sample group and accept or reject the Hypothesis 1, which posited that increased age would result in lower level of video gaming experience.

3.2.2. Hypothesis 2 (Video gaming and kinesthetic learning)

As stated above, the technologies of the modern world are having a significant influence on the learners of the modern age (Oblinger & Oblinger, 2005; Prensky, 2005; Sweeney, 2005; Tapscott, 1998). To investigate this idea, the researcher theorized that

prolonged exposure to the interactive and engaging environments of video-games would result in an increased preference for hands-on training. To investigate this theory, a preferred learning style measure was required.

An in-depth review of the available learning style measures was conducted and the 16-question Visual-Aural-Read/Write-Kinesthetic (VARK) questionnaire developed by Fleming (1987) was selected. The primary reason for this selection was that the VARK categories are based directly on the individual's data input and output preferences, rather than indirectly predicting their learning strengths through a personality assessment. Given that this research was focused on learner preferences, this measure seemed the best fit for this study. Second, the learning categories measured by the VARK questionnaire are well documented and include teaching and studying techniques for each style of learner. The final reason for the VARK selection was that not all individuals can be neatly organized into nice and neat categories. Some learners prefer a mix of the learning categories and the VARK questionnaire allowed the researcher to measure the sample group's tendency for multimodal learning.

While the VARK brought several advantages, one disadvantage was that the questionnaire has not been thoroughly as of this research effort. According to the VARK homepage (2008), the questionnaire is under evaluation by Dr. Marilla Svinicki at the University of Texas at Austin to determine its statistical validity and reliability. According to Svinicki, she is not ready to validate the questionnaire as a research tool because "the wording on some of the items may confuse the perspective of the learner with the individual with whom the learner might be communicating and the multiple options which an individual can choose in answering" (Fleming, 2008) However,

Svinicki did state, “if you are using it as a teaching instrument, it is more than satisfactory for that use and it has excellent instructional materials to support it” (Fleming, 2008). Given the nature of this research effort, Svinicki’s statement and the testimonial support for the questionnaire gave the researcher confidence that the VARK questionnaire was a suitable instrument for this thesis effort. The full measure is listed in Appendix A (Fleming, 2008).

Once selected, a careful review of the VARK preference categories led the researcher to theorize that prolonged exposure to video-games would result in an increased preference for kinesthetic learning. Therefore, Hypothesis 2 states that increased exposure to video-games contributes to an increased preference for kinesthetic learning. A statistical correlation between the video-game experience and VARK data was used to test this relationship.

3.2.3. Hypothesis 3 (Video gaming and read/write learning)

Hypothesis 3 examines the relationship between the video-game construct and the read/write learning preference. In addition to increasing kinesthetic learning, the researcher also theorized that prolonged video-game exposure would result in a decreased preference for read/write learning. It was hypothesized that the interactive gaming experience would result in an increased need for engagement and stimulation, thus lowering the subject’s patience for reading. Therefore, the hypothesis states that increased exposure to video-games contributes to a decreased tendency for a read/write learning preference. A correlation between the video-game and read/write construct was conducted to validate or reject this statement.

3.2.4. Hypothesis 4 (Kinesthetic learning and training motivation)

The fourth step in the research process was to evaluate the influence the kinesthetic learning style has on training motivation within the current environment. The researcher theorized that the relationship between kinesthetic learning and "motivated to learn" would be negative in the current training environment. The rationalization behind this presumption was the belief that the current training environment was primarily instructor-driven with limited hands-on training. A measure for motivation to learn was required to investigate this notion.

The selected motivation to learn measure was a 5-item scale originally proposed by Noe and Schmitt (1986) and later adapted by Orvis, Horn, and Belanich (2006). Sample items include "I am trying to learn as much as I can from this course" and "I plan to exert a lot of mental effort to learn the material presented in the course." The responses are based on a Likert scale with responses ranging from 1 (strongly agree) to 5 (strongly disagree). The past reliability of this measure was the primary reason for the selection of this scale. According to Orvis, Horn, and Belanich (2006), the coefficient alpha for the scale was 0.87, which is well above the academically accepted standard of 0.70 (Nunnally, 1978; Peterson, 1994). See Appendix A for a complete list of the survey questions.

Once the data was collected, a statistical correlation was run between the learning preference and motivation to learn constructs to test the hypothesis, "The current training environment will have a negative influence on kinesthetic learner's motivation to learn."

3.2.5. Hypothesis 5 (Read/write learning and training motivation)

Hypothesis 5 evaluates the relationship between the read/write learning style and motivation to learn. The researcher speculated that the current training environment was positively suited for the read/write learners. Therefore, it was believed that the read/write learners would be positively motivated by the current training environment. Based on this assumption, the fifth hypothesis states that, "Read/write learners are positively motivated to learn in the current training environment." A correlation was run between the constructs to test the hypothesis.

3.2.6. Hypotheses 6a and 6b (Moderating influence of goal orientation)

The next stage of the research process focused on the influence of goal orientation on the motivation to learn of the kinesthetic and read/write learners. Based on the information reviewed during the literature review, the researcher predicted that goal orientation would have a positive moderating influence on the relationship between the learning preference and motivation to learn constructs. According to the literature, "goals are widely recognized as being central to the understanding of motivated behavior" (Orvis, Horn, & Belanich, 2006) and an individual's level of "goal orientation should influence their cognitions and behaviors during a learning experience" (Bell & Kozlowski, 2002). Therefore, an individual's level of goal orientation should influence their overall motivation to learn regardless of training environment (Sonnentag, Frese, Brodbeck, & Heinbokel, 1997; VandeWalle, 2003).

The goal orientation measure was a 13-item scale adapted from Orvis, Horn, and Belanich (2006) that used a 1 (strongly agree) to 5 (strongly disagree) Likert scale to

measure learning goal orientation (5 items), performance prove goal orientation (4 items), and performance avoid goal orientation (4 items).

Learning goal orientation

Learning goal orientation relates to an individual's dedication to developing competencies by acquiring new skills, mastering novel situations, and learning from past experience (Dweck, 1986; Dweck & Leggett, 1988; Orvis, Horn, & Belanich, 2006; Vandewalle, 1997). Learning oriented students seek challenges to increase their competencies and "perceive training as an opportunity to learn…believe demonstration effort and persistence…is worthwhile for increasing one's competence" (Orvis, Horn, & Belanich, 2006).

Performance prove goal orientation

These individuals accept their abilities and skill levels as relatively stable and unlikely to change. Hence, these learners tend to focus on demonstrating and validating their competence by seeking good performance evaluations and avoiding negative ones (Dweck, 1986; Orvis, Horn, & Belanich, 2006). Generally, these learners are more concerned with superficial demonstrations of their abilities rather than substantive development. They tend to prefer learning environments that are familiar and do not require much effort to master (Orvis, Horn, & Belanich, 2006).

Performance avoid goal orientation

Learners with a high level of performance avoid goal orientation tend to avoid situations in which their competencies may be seen as low by others (Brett & Vandewalle, 1999; Vandewalle, 1997). Prior research has shown that performance avoid goal orientation is associated with a negative effect on learners during training (Orvis,

Horn, & Belanich, 2006). Schmidt and Ford (2003) stated that trainees with a high measure of performance avoid goal orientation engage in less metacognitive activities during training which limits the effectiveness of the training program.

The past statistical reliability of the measure was the primary reason for the selection of this goal orientation scale. Orvis, Horn, and Belanich (2006) stated that the coefficient alphas for the measures were 0.85 (learning), 0.82 (avoid), and 0.78 (performance), which are well above the approval threshold. The complete measure is located in Appendix A.

Once the data was collected, statistical correlations and linear regressions were run between the kinesthetic learning preference, read/write learning preference, and motivation to learn constructs to test the hypotheses: "Goal orientation positively moderates the relationship between the kinesthetic learning style and motivation to learn" and "Goal orientation positively moderates the relationship between the read/write learning style and motivation to learn."

3.2.7. Hypothesis 7 (Training motivation and performance self-assessment)

The final relationship evaluated by this research was the influence training motivation had on the sample group's confidence of performance. It was theorized that highly motivated individuals would be more confident of their performance than individuals with a low level of motivation to learn. A single question measure was developed for this measure, "If grades were assigned during the training, what grade (expressed in percentages) would you expect to receive?" The possible answers ranged from 1 (70%) to 7 (96%-100%) (Appendix A). It is important to note that the measure is a self-assessment and based on the participant's overall impression of how they feel they

are doing in the course and their response in no way represents their actual course performance in the subject.

To test this theory, the researcher developed Hypothesis 7 which states that motivation to learn is positively related to an individual's performance self-assessment. To test this hypothesis, a correlation was run between the motivation to learn and performance self-assessment data sets.

3.3. Survey Administration

To satisfy the goals of this research, a population of the students undergoing initial skills training was required. Therefore, the researcher communicated directly with a point of contact (POC) from the 82nd Training Wing, via email and the telephone, to administer the survey. During these conversations, the researcher discussed the purpose for the research, the desired demographics of the subjects, and directions for administration of the survey. Additionally, the researcher informed the POC that the students' participation in the survey effort was voluntary. Once approved for release, the survey was submitted via email to the POC with instructions to print for administration and return the paper-based copies via the U.S. postal service to the researcher. To administer the survey, the POC submitted the survey to the initial skills training instructors with a suspense of 22 Jan 2009 for completion. The surveys were completed during the student's classroom instruction time and on 23 Jan 2009 the completed surveys were sealed for delivery and shipped to the researcher for input into the research database. The survey administration resulted in 866 successfully completed surveys.

3.4. Research Population and Sample

The development of an effective data collection instrument and survey administration is important. However, that is only a part of the overall research effort. Another important step in the data collection and analysis procedure is the determination of an appropriate population for the research effort.

The purpose of the research is to investigate the learning preferences of the millennial generation recruits receiving training in a military training environment. To satisfy this purpose, the population selected for this study was the students attending initial skills training at the 82nd Training Wing, Sheppard AFB, TX (AETC, 2009). Within this population, the sample was drawn from the 361st, 362nd, and 363rd Training Squadrons of the 82nd Training Group. The training courses within these squadrons include aerospace ground equipment, aerospace propulsion systems, aircraft fuels systems, aircrew egress systems, vehicle body repair, survival equipment, metals technology, structural maintenance, nondestructive inspection, aircrew life support training, aircraft maintenance officer, crew chief, analysis, scheduling, loadmaster, aircraft armament, and munitions career fields (AETC, 2009).

3.5. Data Analysis

Once the data was received, the researcher began the data analysis process by transferring the data from the hardcopy versions of the survey into an Excel 2007 spreadsheet. This process increased the potential for data entry errors, so to verify the accuracy of the transferred data, the researcher randomly selecting 16 records and confirmed that the database matched the survey data. This equated to the review of 640

questions with zero data entry errors indentified. The remainder of this section explains the statistical methods used to analyze the survey data.

3.5.1. Validity Determination

The initial step in the data analysis process was the validation of the survey measures. When possible, statistical validation is accomplished with parallel forms and a test-retest of the measures (Zumbo, 1999). However, the geographic separation, short timeframe, and amount of data collected, made this process impractical. Therefore, an evaluation of the coefficient alphas for the measures was used for this study. The coefficient alpha evaluation, resultant values, and levels of significance were calculated by the researcher within the SPSS16.0 software package.

In addition to coefficient alpha, a factor analysis of the motivation to learn and goal orientation measures was conducted. The factor analysis allowed the researcher to identify poorly worded measures and ensure that the different components within the measures were properly loading on the same factor (Garson, 2009). This review also allowed the researcher to identify and drop proposed scale items which cross-loaded on more than one factor. This analysis was accomplished in the SPSS 16.0 software environment with direct Oblimin rotation activated.

3.5.2. Correlation Evaluation

The next level of statistical evaluation was a check of the statistical correlation between the constructs of the research model. Correlation is a common method of statistical evaluation that provides a single number "that describes the degree of relationship between two variables" (Trochim, 2006). The required standard of significance for this project was an alpha of 0.05 or lower. This is a commonly accepted

level of significance that indicates the odds that the correlation is a chance occurrence is no more than 5 out of 100 (Trochim, 2006).

3.5.3. Descriptive Evaluation

The third statistical assessment conducted on the data was a descriptive evaluation of the demographics (age, and video-game) and VARK questionnaire data. This descriptive evaluation consisted of the mean average, range of the data, standard deviation, and mode of the responses. The purpose of this portion of the statistical evaluation was to increase the researcher's understanding about the sample population.

3.5.4. Moderation Evaluation

The final statistical analysis conducted during this research was an investigation of the moderating influence of an individual's goal orientation on his or her motivation to learn. To perform this evaluation, the researcher used the transform function within SPSS 16.0 to create new cross-product constructs between the kinesthetic and goal orientation and read/write and goal orientation constructs. Once the cross-product constructs were developed, the researcher ran a correlations and linear regressions between the cross-product, goal orientation, and the motivation to learn datasets.

3.6. Summary

The development of a valid research model with appropriate constructs was critical to the success of this research project. This chapter explained the constructs and design of the research model. Additionally, the chapter explained how the research measures and sample were selected. Lastly, the chapter described the statistical

evaluations conducted on the data to validate the research constructs and examine the relationships between the research constructs.

4. Analysis and Findings

4.1. Introduction

This chapter provides an explanation of the statistical results from the survey data and is organized in three main sections. The first section provides an explanation of the construct validation effort to include the coefficient alphas and results of the factor analysis. The second section provides a brief explanation of the information gained from the descriptive evaluation of the age, video gaming, and VARK measures. The last section communicates the findings of the hypotheses evaluations and provides a detailed explanation of the results.

4.2. Reliability

This section discusses the results of the reliability analysis of the research measures. Hopkins (2000, p.2) states that, "Reliability refers to the reproducibility of values on a test, assay, or other measurement in repeated trials on the same individuals." For this research, reliability was established throught the use of coefficient alphas. The results of these evaluations are next.

4.2.1. Coefficient Alpha

During survey development, careful consideration was given to existing measures with a sufficient level of proven reliability. Based on the research, the Orvis, Horn, and Belanich (2006) measure for motivation to learn and goal orientation was selected. The original and current coefficient alphas are presented in Table 1. The reliability of the five

items within the measure were re-evaluated because the wording of the original questions were changed for the current research environment. The original motivation to learn construct measured the level of motivation within a game-based training environment. To accommodate the needs of this study, the references to game-based training were removed and replaced to address the classroom training environment. As a result of these changes, the Cronbach's alpha for the new measure dropped to 0.802. This is still acceptable since the goal is an alpha of 0.7 or better (Nunnally, 1978; Peterson, 1994).

	Original	Current
Motivation to Learn	0.87	0.802
Goal Orientation		
Learning Goal Orientation	0.85	0.868
Performance Avoid Goal Orientation	0.82	0.784
Performance Prove Goal Orientation	0.78	0.809

Table 1. Coefficient Alpha Values (Orvis, Horn, & Belanich, 2006)

The Cronbach's alphas for the three aspects of goal orientation were also re-evaluated (Table 1) and the combined Cronbach's alpha for the entire 13-item scale was 0.722. While this alpha is technically acceptable, the number of questions in a measure has a positive influence on the value of the measure's alpha (Cortina, 1993). The high number of items and the relatively low alpha of the goal orientaion measure makes this construct suspect. Therefore, additional research may be needed to develop a more reliable goal orientation measure for future studies.

The last construct used in the survey was the VARK questionnaire to collect information on the data input and output preferences of the sample group. As mentioned in the previous chapter, the statistical validity of this questionnaire is still under review by Dr. Svinicki so no definitive statement can be made at this time.

4.2.2. Factor Analysis

The second phase of the reliability evaluation was a factor analysis of the goal orientation and motivation to learn measures. As shown in Table 2, the factor analysis successfully identified all four components of the measures, revealed a clear separation, and limited cross loading within all but one of the survey questions. The results of the factor analysis showed that question 20 of the survey failed to load correctly and heavy cross-loading was evident. Valid questions with low cross-loading have a clear distinction from the other questions of the measure. However, the low separation between the values returned for question 20 indicates that cross loading was occurring with components 1 and 2 of the construct. Based on this information, the researcher removed question 20 from all remaining statistical evaluations. The alpha for the goal orientation construct without question 20 was 0.712. With question 20, the Cronsbach alpha for the goal orientation prove construct was 0.751. Without question 20, the alpha for the measure increased from .78 to 0.809.

Factor Analysis Pattern Matrix				
	Component			
	1	2	3	4
GOLearn (14)	**.772**	.009	-.008	.056
GOLearn (15)	**.770**	-.143	-.083	-.005
GOLearn (13)	**.770**	-.116	.031	-.140
GOLearn (12)	**.720**	-.032	.045	-.199
GOLearn (11)	**.668**	-.044	.057	-.299
GOAvoid (19)	-.114	**.813**	.005	-.032
GOAvoid (18)	-.059	**.811**	.010	-.038
GOAvoid (16)	-.048	**.758**	.031	-.049
GOAvoid (17)	.018	**.715**	-.001	.005
GOProve (23)	-.043	-.072	**-.893**	-.107
GOProve (22)	-.121	-.062	**-.889**	-.105
GOProve (21)	.117	.097	**-.750**	.054
ML (5)	.132	-.023	-.050	**-.784**
ML (6)	-.091	.009	-.104	**-.769**
ML (7)	.244	-.059	-.101	**-.709**
ML (9)	.168	.209	.011	**-.562**
ML (8)	.279	.013	.021	**-.559**
GOProve (20)	**.289**	**.251**	**-.309**	**.352**
Extraction Method: Principal Component Analysis Rotation Method: Oblimin with Kaiser Normalization.				
a. Rotation converged in 11 iterations.				

Table 2. Factor Analysis Results

4.3. Descriptive Evaluation

This section discusses the results of the descriptive evaluation of the age, video-game experience, and VARK data. The purpose of this evaluation was to identify the common factors and trends within the data; it is structured in accordance with the research model, starting with age, video-game experience, and ending with the VARK measure.

4.3.1. Age

One of the guiding principles behind this research was the assertion that the educational needs of the members of the millennial generation entering the service may

not be adequately satisfied within the current Air Force training environment (Lessel, Mattison, & Werchan, 2008; Looney, 2008). To evaluate this assertion, the millennial generation must be adequately represented by the sample group. The age question was used to make this determination. Based on the literature, the members of the millennial generation were born between the years of 1980-2001 (Lessel, Mattison, & Werchan, 2008), which equates to 28 years old and under. The data analysis revealed that the mean age of the research participants was 21.6 years old, with approximatly 98% of the participants surveyed being 28 years old or younger. The data also showed that the ages of the 866 participants ranged from a minimum age of 17 to a maximum age of 48 with a standard deviaton of 3.56. Additionally, the most prevalent age within the population was 19. This information clearly indicated that the sample popualtion was appropriate for the needs of this research project.

4.3.2. Video-Game Experience

The results of the video-game experience question showed a wide range of video-game play within the sample. According to the data, the sandard deviation of the sample was 18.9 and the average amount of time participants spent playing video-games was 12.62 hours per week, with 29.21% of the sample spending more than the average amount of time gaming in the average week. Additionally, the time spent gaming ranged from 120 hours a week to 13% of the trainees reporting a complete lack of video gaming experience. The value of 120 hours gaming seemed unrealistic. However, the large sample size helps to negate the influence of these outliers so they were left in the sample. Based on this information, the results were deemed acceptable and indicate that video gaming is an important element of the personal lives of a major portion of the sample.

4.3.3. VARK

The information gathered from the VARK questionnaire was consolidated and statistically evaluated to determine the learning style breakdown of the sample group. This research project was primarily focued on the kinesthetic and read/write learners so this discussion will concentrate on this segment of the sample. The results of the analysis are shown in Figure 3 and Table 3.

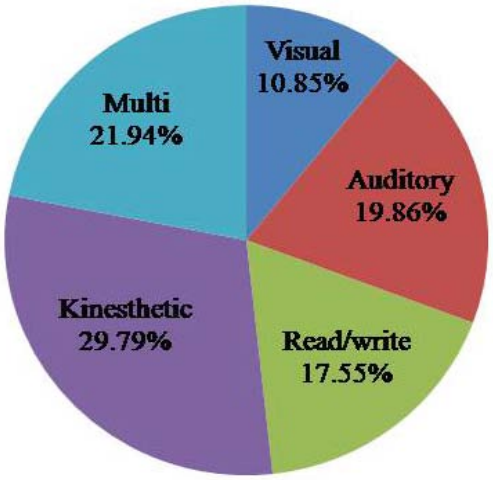


Figure 3. VARK Breakdown

VARK Category	#	% of sample
V	94	10.85%
A	172	19.86%
R	152	17.55%
K	258	29.79%
Multi	190	21.94%

Table 3. VARK Detail Breakdown

The data revealed that 29.79% of the sample were kinesthetic learners and 17.55% of the population preferred read/write learning. The data also revealed that approximately 22% of the individuals had a multimodal preference (Table 4).

Category	#	% of sample
VA	14	7.37%
VR	13	6.84%
VK	30	15.79%
AR	16	8.42%
AK	52	27.37%
RK	23	12.11%
VRK	10	5.26%
VAR	9	4.74%
VAK	10	5.26%
ARK	10	5.26%
VARK	3	1.58%

Table 4. Multimodal Detail Breakdown

This detailed breakdown reveals that approximately 73% of the multimodal learners have kinesthetic learning as one of their preferences. A combination of these multimodal learners and kinesthetic learners shows that approximately 46% of the total population has kinesthetic learning as one of their preferred learning styles. The data also revealed that just over 44% of the multimodal learners had a read/write preference. This equates to 27.3% of the total sample population having a read/write learning preference.

4.4. Hypothesis Discussion

Once the descriptive analysis was completed, the focus of the research shifted to an evaluation of the research hypotheses. To test the hypotheses, the researcher used SPSS 16.0 and ran correlations between the constructs being investigated. The results of the correlations are presented in Table 5, and explanations of the significance of the findings are discussed in the remaining sections.

		A	VG	V	A	R	K	Multi.	GO	ML	Perf.
Age	Pearson	1.000									
	Sig. (1-tailed)										
	N	866									
Video Game	Pearson	-.097**	1.000								
	Sig. (1-tailed)	.002									
	N	865	865								
V	Pearson	.009	.036	1.000							
	Sig. (1-tailed)	.394	.143								
	N	866	865	866							
A	Pearson	-.080**	-.019	.417**	1.000						
	Sig. (1-tailed)	.009	.287	.000							
	N	866	865	866	866						
R	Pearson	.175**	-.061*	.455**	.276**	1.000					
	Sig. (1-tailed)	.000	.037	.000	.000						
	N	866	865	866	866	866					
K	Pearson	-.013	.033	.409**	.323**	.153**	1.000				
	Sig. (1-tailed)	.352	.164	.000	.000	.000					
	N	866	865	866	866	866	866				
Multi	Pearson	.019	-.020	.046	.038	-.009	-.023	1.000			
	Sig. (1-tailed)	.287	.274	.089	.134	.395	.250				
	N	866	865	866	866	866	866	866			
G.O.	Pearson	.120**	-.006	.005	-.022	-.008	-.023	.019	1.000		
	Sig. (1-tailed)	.000	.426	.444	.256	.408	.252	.287			
	N	866	865	866	866	866	866	866	866		
M.L.	Pearson	-.036	.091**	-.054	-.044	-.170**	-.088**	.020	.384**	1.000	
	Sig. (1-tailed)	.143	.004	.057	.096	.000	.005	.280	.000		
	N	866	865	866	866	866	866	866	866	866	
Perf.	Pearson	-.126**	.069*	-.066*	-.051	-.112**	-.078*	-.004	.128**	.184**	1.000
	Sig. (1-tailed)	.000	.022	.025	.066	.000	.011	.451	.000	.000	
	N	864	863	864	864	864	864	864	864	864	864

** Correlation is significant at the 0.01 level (1-tailed)
* Correlation is significant at the 0.05 level (1-tailed)

Table 5. Correlation Results

4.4.1. Age and Video-Game Experience

Hypothesis 1 stated that increased age will result in a lower level of gaming experience. To test this hypothesis, a correlation was calculated and the resultant Pearson correlation was -0.097** (Table 5). This indicates that there was a significant negative relationship between the age and video-game constructs at a significancy level of 0.01 on a 1-tail test. The finding suggests that increased age does have a negative influence on the subject's tendency for gaming. Therefore, it is reasonable to assert that older individuals are less likely to play video-games and supports the claim of Hypothesis 1.

4.4.2. Correlation between Video Gaming and Preferred Learning Style

Hypotheses 2 and 3 focus on the relationship between an individual's video gaming experience and his or her preferred learning styles. For Hypothesis 2, the researcher predicted that increased video gaming would result in an increased preference for kinesthetic learning. The correlation between the video-game and kinesthetic datasets resulted in a Pearson correlation coefficient of 0.033 (Table 5). This indicated that video gaming experience is not significantly correlated with a preference for kinesthetic learning, so Hypothesis 2 was rejected.

Next, an evaluation of the relationship between video gaming and read/write learning was conducted to test the third hypothesis. For this hypothesis, the researcher theorized that extensive gaming would result in a decreased desire for read/write learning. The resulting Pearson correlation coefficient was -0.061* (Table 5). This suggests that the relationship between the read/write and video gaming construct is significant in the negative direction and supports the claim of the third hypthesis. However, the results of the Hypothesis 2 evaluation raised concern over the validity of

this claim. Therefore, a correlation was run between all of the VARK categories and the video gaming construct. The resultant Pearson correlation coefficients for the visual, auditory, read/write, kinesthetic, and multimodal categories were 0.036, -0.019, -0.061*, 0.033, and -0.020, respectively (Table 5). These alphas show that only the read/write category was significantly influenced by the video-games.

Based on this information, the researcher found no support for the assertion that video gaming experience had a significant influence on an individual's preferred learning style. Therefore, Hypotheses 2 and 3 were both rejected.

4.4.3. Learning Styles and Motivation to Learn

Hypotheses 4 and 5 focus on the relationship between an individual's preferred learning style and their motivation to learn within the current training environment. Hypothesis 4 states that the current training environment would have a negative influence on the kinesthetic learners' motivation to learn. A correlation between kinesthetic and motivation to learn datasets resulted in a correlation coefficient of -0.088** (Table 5). This indicates that the relationship between the kinesthetic and motivation constructs is significant and negative. Therefore, it was reasonable to claim that the current training environment is not well suited for the kinesthetic learners. Based on this information, Hypothesis 4 was supported.

The next step in the analysis process was to investigate the fifth hypothesis. Hypothesis 5 states that read/write learners are positively motivated to learn in the current training environment. The result of this correlation was a Pearson coefficient of -0.170** (Table 5). This suggests that the current learning environment has a negative influence on the motivation to learn of the read/write learners and indicates that the current learning

environment is also poorly suited for the read/write learning style. This contradicts the claim of the hypothesis, so Hypothesis 5 was rejected.

4.4.3. Moderation of Goal Orientation

Two hypotheses were developed to investigate the influence an individual's level of goal orientation had on their motivation to learn. Hypothesis 6a stated that goal orientation would positively moderate the relationship between the kinesthetic learning style and motivation to learn; Hypothesis 6b stated that goal orientation would positively moderate the relationship between the read/write learning style and motivation to learn. To investigate these hypotheses, cross-products between the kinesthetic and goal orientation datasets (K-GO) and the read/write and goal orientation datasets (R-GO) were created. Next, K-GO and R-GO were each correlated with the motivation to learn dataset. The results of these correlations are presented in Table 6. A comparison of these results with the results discussed in the previous section, revealed that the kinesthetic learners have gone from an alpha of -0.088** which was negatively significant to a positive 0.055 alpha. This indicates that the kinesthetic learners are no longer de-motivated in the current training environment. Additionally, the alpha for the read/write learners has also improved from a -0.170** to -0.067*. This indicates that the motivation of the read/write learners has also improved.

Correlations

		Motivation to Learn (this course)	KRAWXGO	RRAWxGO
K-GO	Pearson Correlation	.055	1.000	.230**
	Sig. (1-tailed)	.053		.000
	N	866	866	866
R-GO	Pearson Correlation	-.067*	.230**	1.000
	Sig. (1-tailed)	.024	.000	
	N	866	866	866

** Correlation is significant at the 0.01 level (1-tailed)

* Correlation is significant at the 0.05 level (1-tailed)

Table 6. Cross-Product Correlations

The next step needed to evaluate the moderation of goal orientation between kinesthetic learning and motivation to learn was to run two separate linear regressions with motivation to learn as the dependent variable for both. For the first run, the independent variable included kinesthetic and goal orientation. For the second regression, the independent variables included kinesthetic, goal orientation, and K-GO. The results of the regressions are present in Table 7 and Table 8.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.134	0.143		0.938	0.348
	Kinesthetic	-0.025	0.010	-0.080	-2.543	0.011
	Goal Orientation	0.560	0.046	0.382	12.203	0.000

a. Dependent Variable: Motivation to Learn (this course)

Table 7. Linear Regression without K-GO

The regression without K-Go resulted in a Beta value of -0.080 and a significance factor of 0.011. This indicates that the kinesthetic learners are significantly de-motivated in the current learning environment. However, the second regression with K-GO included resulted in a Beta value for kinesthetic learning of 0.247 and the significance factor increased to 0.140 (Table 8). This shows that the relationship is no longer significant because the significance factor is greater than 0.05 and the kinesthetic learners are no longer de-motivated to learn.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-0.423	0.314		-1.347	0.178
	Goal Orientation	0.759	0.110	0.518	6.891	0.000
	K-GO	-0.037	0.018	-0.356	-1.990	0.047
	Kinesthetic	0.077	0.052	0.247	1.478	0.140

a. Dependent Variable: Motivation to Learn (this course)

Table 8. Linear Regression with K-GO

The final step needed to fully evaluate hypotheses 6a and 6b was to repeat the regressions with the read/write dataset. The results of the regressions are documented in Table 9 and Table 10. The results of the initial run provided a Beta of -0.167 and a significance factor of 0.000. This indicates that the read/write learners are significantly de-motivated in the current training environment. The second regression with R-GO included resulted in a new Beta of 0.324 and a significance factor of 0.068 Table 10.

This indicates that the read/write learners are no longer de-motivated in the current training environment.

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.203	0.134		1.512	0.131
	Goal Orientation	0.561	0.045	0.383	12.381	0.000
	Read/Write	-0.046	0.008	-0.167	-5.418	0.000

a. Dependent Variable: Motivation to Learn (this course)

Table 9. Linear Regression without R-GO

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.394	0.251		-1.571	0.117
	Goal Orientation	0.776	0.089	0.530	8.723	0.000
	Read/Write	0.089	0.048	0.324	1.825	0.068
	R-GO	-0.049	0.017	-0.519	-2.811	0.005

a. Dependent Variable: Motivation to Learn (this course)

Table 10. Linear Regression with R-GO

These findings indicate that goal orientation is significantly related to motivation to learn. Therefore, the claims that goal orientation moderates motivation to learn for both the kinesthetic and read/write learner are supported.

4.4.4. Motivation to Learn and Performance Self-Assessment

The final hypothesis states that motivation to learn is positively related to an individual's performance self-assessment. The data supports this claim with a Pearson correlation of 0.184**, which is significant at a .01 level on a one-tail test. Based on this information, motivated trainees are much more confident of their performance than non-motivated trainees. This finding further highlights the importance of training motivation and further supports the need for research into the millennial generation learners. The next chapter will address this need by presenting the conclusions drawn from statistical analysis of the survey data and present some future recommendations.

5.0 Conclusions and Recommendations

5.1. Introduction

The purpose of this research was to investigate the influence that past gaming experience had on learning preferences and examine the impact these preferences have on motivation to learn within a military training environment. To satisfy this objective, a survey was developed and data was collected and statistically evaluated. This chapter discusses the conclusions, recommendations, and limitations of this research and closes with some recommendations for future research.

5.2. Conclusions

The research conducted for this thesis was focused on answering four research questions. These questions are answered in the following sections with detailed discussions of the conclusions drawn from the results of the statistical evaluations.

5.2.1. Do Video-Games Influence an Individual's Preferred Learning Style?

Answering this question first required an evaluation of the prevalence of gaming within the sample group to determine if age influenced the amount of time spent playing video-games. The results showed that as the age of the sample increased, the tendency to spend time playing video-games decreased. This suggested that video-games are prevalent in the millennial generation. In fact, the data revealed that 64.4% of the millennials in the sample spend 3 or more hours playing games in an average week. Based on this information, it seemed plausible that this gaming experience would have a significant influence on the learning preferences within the sample. However, a correlation between the video-game and preferred learning style datasets revealed that

this gaming experience had little to no influence on the subjects' preferred learning styles, as measured by the VARK questionnaire. Therefore, it was determined that prolonged exposure to video-games did not have a significant effect on an individual's preferred learning style.

5.2.2. Does Learning Style Influence Motivation to Learn?

To answer this question, a correlation was run between the preferred learning style and motivation to learn constructs. The results of the correlation revealed that both the kinesthetic and read/write learners were significantly de-motivated by the current learning environment, with the read/write learners being the most de-motivated. Additionally, the visual and auditory category learners were shown to be de-motivated but not significantly. This implies that the current learning environment is better suited for the visual and auditory styles than it is for the read/write and kinesthetic styles. Therefore, an individual's learning style was shown to influence their motivation to learn.

5.2.3. Does goal orientation influence motivation to learn?

Perhaps the most significant finding to emerge during this research was discovered while answering this question. The results showed that goal orientation was significantly related to motivation to learn. In fact, the influence was significant enough to improve motivation within the read/write category and the motivation of the kinesthetic category was no longer negative. Additionally, the motivation within both the visual and auditory categories became significantly positive. This indicates that a sufficient level of goal orientation can effectively negate the negative influence of a mismatch between learner preference and learning environment. Originally, goal orientation was believed to have a moderating influence on an individual's motivation to

learn. However, these findings indicate that it may be more appropriate to model an individual's level of goal orientation as a mediator between learning style and motivation to learn as shown in Figure 4.

Figure 4. Goal Orientation Mediation

Based on this information, individuals with a high level of goal orientation are so driven to learn that they can be motivated to learn regardless of the training environment. This finding could hold great implications for the Air Force and the future of Air Force training.

5.2.4. What impact does motivation to learn have on performance confidence?

The final area of research for this study was to determine how motivation to learn influenced an individual's confidence of performance. The statistical analysis of the survey data revealed that highly motivated individuals were more confident of their overall performance in the training. Therefore, increasing motivation to learn will have a direct influence on the overall confidence of the students in training.

5.3. Recommendations

This research was focused on the effective training of the millennial generation, so the initial recommendation is intended for the 82nd Training Wing. Initially, the researcher postulated that the video gaming background of the millennial generation

recruits had led to a predominance of kinesthetic learning within the sample population. However, the survey data failed to support this claim and showed no clear indication that any single learning style stood out as the prevailing preference. Therefore, altering the course content and training approach to focus on a specific learning style could lead to little or no significant improvement in overall training motivation. Given that no single preference was shown to have a significant advantage over the other categories, the best way to improve training effectiveness is by first identifying the specific learning preferences of the students. This might be followed by teaching them how to effectively study based on their individual preferences. For this, the students should complete the VARK questionnaire to map their learning traits. Once the mapping is complete, the instructors should give a brief review of the recommended study strategies for each of the VARK learning styles. A complete list of recommended study strategies are found in Appendixes B-E (Fleming, 2008). If implemented, the 82nd Training Wing should realize immediate benefits with little to no out-of-pocket expenses.

In addition to mapping the students' learning preferences, a recommendation for improving training motivation within the 82nd Training Wing, AETC, and the Air Force is to nurture the learning goal orientation of the trainee population. The learning component of the goal orientation construct was selected because it "is associated with the belief that ability can be developed" and it "motivates individuals to increase their competence and to master challenging situations" (Erez, 2005). The results of the research show that increased learning goal orientation has a direct influence on motivation to learn. Additionally, high motivation was shown to have a significant impact on the performance self assessment within the sample group. Therefore,

increasing the learning goal orientation within the sample group will directly influence the motivation and confidence of the group. Zimmerman (2002) stated, "Intrinsic interest refers to the students' valuing of the task skill for its own merits, and learning goal orientation refers to valuing the process of learning for its own merits. Students who find the subject matter of history, for example, interesting and enjoy increasing their mastery of it are more motivated to learn in a self-regulated fashion." Therefore, increasing the students' understanding of how they fit into the overall Air Force mission and explaining how the classroom information contributes to their future Air Force success should directly influence the students' learning goal orientation by increasing the value of the information being taught.

Lastly, AETC's leadership has stated that the Air Force must transform itself into a learning organization in order to adapt to dramatic world-wide changes in the future (Lessel, Mattison, & Werchan, 2008). To satisfy this requirement, leadership should foster a learning culture within the organization. Several approaches could be used to foster this learning culture. The first approach would be to increase the individual's career commitment. Research has shown that increased organizational commitment leads to better understanding of the importance of training (Colquitt, LePine, & Noe, 2000). Therefore, leadership should stress the incorporation of past operational experience within the training environment to help the trainees understand the importance of their contributions to the Air Force mission. Next, individuals must conduct realistic self-assessments to better understand their strengths and weaknesses. Colquitt, LePine, and Noe (2000) described this as career exploration and stated that individuals with "high levels of career exploration are likely to have high training motivation, because they can

more clearly see the link between learning and the development of their strengths and weaknesses." Leadership should foster this environment of self-assessment by providing an initial evaluation at career initiation and continue feedback throughout their professional development. The last approach needed to increase the learning culture within an organization is career planning. Career planning refers to the development of clear, specific plans for achieving career goals. This contributes to learning motivation because it helps the individual understand the importance of training and its role in helping them realize their career aspirations. For this to be possible, leaders must serve as mentors during the development of these career plans. Without leadership guidance, lessons learned would be lost, and this could contribute to potential replication of past mistakes. However, leadership involvement would help to ensure proper career planning and give the individuals the direction needed for career success.

5.4. Limitations

During the course of this research, several limitations were identified. First, the statistical evaluation of the collected data revealed a need for additional demographic information. For example, training course and stage of training information was needed to allow a more in-depth study of overall training effectiveness. Second, the survey failed to collect any information on the actual performance of the subjects. Therefore, the researcher was unable to make any definitive evaluations of the actual effect of training motivation on performance. Third, the VARK questionnaire used to identify the learner preferences has not been statistically validated. Lastly, evaluating the influence of mediation and moderation is an arduous process, and at the time of this study, the

researcher did not explore a means to fully evaluate the nature of the relationships between the research model constructs.

5.4. Future Research Recommendations

The focus of this research effort was to evaluate the effectiveness of the current Air Force training environment. However, during the course of the study, several other supplementary areas of research began to emerge that would expand the results of this effort and benefit the Air Force.

1. Evaluate the effectiveness of focused study based on individual learning preferences. The researcher recommends the use of the VARK questionnaire to identify individual learning preferences and recommend study strategies based on these individual inclinations. Once implemented, additional research is needed to evaluate the effectiveness of this new training approach and determine the feasibility of greater implementation within the Air Force.

2. Research the effect of goal orientation on training motivation and investigate means of increasing individual levels. This research has shown that goal orientation has a significant influence on training motivation. However, further research is needed to determine the magnitude and true nature of this relationship. Additionally, research is needed to determine the ways of increasing individual levels of learning goal orientation.

3. Research the feasibility of game-based training within the Air Force. According to the findings of this research, 86% of the millennial recruits play video-games and over 53% spend 5 or more hours gaming per week. These

numbers indicate a strong gaming culture within the millennial population and hint to the potential of game-based training. Therefore, research should be done to investigate the benefits of this training approach and determine the best game design for maximized training effectiveness.

5.5. Summary

The primary purpose of this exploratory research was to begin building a body of knowledge on effectively training the millennial recruits entering the Air Force. This purpose was accomplished through a survey of 866 initial skills trainees at the 82nd Training Wing, Sheppard AFB, Texas. The data collected during the survey was then statistically evaluated and the research hypotheses tested. The results showed that the current training environment failed to motivate any of the VARK categories of learning style. However, overcoming this lack of motivation was possible if the trainees were goal orientated. Based on these findings, several recommendations for improving training motivation were provided and ideas for future research were discussed. If the recommendations for action are implemented, the Air Force should see immediate improvements in training effectiveness and lay the foundation for further excellence.

Appendix A: Research Survey

Please answer the following questions as openly and honest as possible to ensure the findings of the survey are as accurate as possible.

1. What is your current age?
_____ Years

2. In the past year, on average, how many hours per week (including weekends) have you spent playing any type (PC-based, Nintendo, Playstation, arcade) of videogame?
_____ Hours/week

3. On average, how much of the instruction manual do you read before playing a new game?

1	2	3	4	5
None	25%	50%	75%	100%

4. What computer games and/or video-games do you prefer? Please rank order (1-8):
(1 being most preferred and 8 least preferred)

_____ First-person perspective (ex. Battlefield 1942, Metal of Honor, Halo, Doom)
_____ Flight simulation (ex. Microsoft Flight Simulator, Falcon 4.0)
_____ Online Multi-player games (ex. World of Warcraft, Everquest, Planetside)
_____ Sports/racing (ex. Madden NFL 2008, Tony Hawk Underground, Car Racing)
_____ Military command/Strategy (ex. Axis & Allies, Rise of Nations, Risk, Starcraft)
_____ Fighting (ex. Mortal Combat, WWE Smackdown)
_____ Life/business simulation (ex. The Sims, Tycoon)
_____ Fantasy/Adventure (ex. Myst IV, Legend of Zelda, Dungeon and Dragons)

5. I am trying to learn as much as I can from this course.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

6. I will exert considerable effort to learn the material presented in the course.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

7. I look forward to actively participating in the training.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

8. I use my own time to prepare for training by practicing and completing assignments.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

9. I will feel upset if I perform poorly during the course.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

10. Presentation format used in this course motivated me to learn the material.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

11. I am willing to select a challenging task/assignment that I can learn a lot from.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

12. I often look for opportunities to develop new skills and knowledge.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

13. I enjoy challenging and difficult tasks at school where I'll learn new skills.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

14. For me, development of my ability is important enough to take risks.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

15. I prefer to work in situations that require a high level of ability and talent.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

16. I would avoid taking on a new task if there was a chance that I would appear rather incompetent to others.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

17. Avoiding poor performance is more important to me than learning a new skill.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

18. I'm concerned about taking a task/assignment at school if my performance would reveal that I had low ability.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

19. I prefer to avoid situations at school where I might perform poorly.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

20. I'm concerned that I show that I can perform better than my classroom.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

21. I try to figure out what it takes to prove my ability to others at school.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

22. I enjoy it when others at school are aware of how well I am doing.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

23. I prefer to work on tasks/assignments where I can prove my ability to others.

1	2	3	4	5
Strongly agree		Agree		Strongly disagree

24. If grades were assigned during the training, what grade (expressed in percentages) would you expect to receive?

1	2	3	4	5	6	7
70	71-75	76-80	81-85	86-90	91-95	96-100

The remaining questions are the VARK (young version) questionnaire used via email permission from Dr. Neil Fleming (September 2008)

Choose the answer which best explains your preference and circle the letter(s) next to it.
Please circle more than one if a single answer does not match your perception.
Leave blank any question that does not apply.

25. I like websites that have:
    a. things I can click on and do.
    b. audio channels for music, chat and discussion.
    c. interesting information and articles in print.
    d. interesting design and visual effects.

26. You are not sure whether a word should be spelled 'dependent' or 'dependant'. I would:
    a. see the words in my mind and choose by how they look.
    b. hear them in my mind or out loud.
    c. find them in the dictionary.
    d. write both words on paper and choose one.

27. You want to plan a surprise party for a friend. I would:
    a. invite friends and just let it happen.
    b. imagine the party happening.
    c. make lists of what to do and what to buy for the party.
    d. talk about it on the phone or text others.

28. You are going to make something special for your family. I would:
    a. make something I have made before.
    b. talk it over with my friends.
    c. look for ideas and plans in books and magazines.
    d. find written instructions to make it.

29. You have been selected as a tutor or a leader for a holiday program. This is interesting for your friends. I would:
    a. describe the activities I will be doing in the program.
    b. show them the map of where it will be held and photos about it.
    c. start practicing the activities I will be doing in the program.
    d. show them the list of activities in the program.

30. You are about to buy a new digital camera or mobile phone. Other than price, what would most influence your decision?
    a. trying it.
    b. reading the details about its features.
    c. it is the latest design and looks good.
    d. the salesperson telling me about it.

31. Remember when you learned how to play a new computer or board game. I learned best by:
    a. watching others do it first.
    b. listening to somebody explaining it and asking questions.
    c. clues from the diagrams in the instructions.
    d. reading the instructions.

32. After reading a play you need to do a project. Would you prefer to:?
    a. write about the play.
    b. act out a scene from the play.
    c. draw or sketch something that happened in the play.
    d. read a speech from the play.

33. You are about to hook up your parent's new computer. I would:
    a. read the instructions that came with it.
    b. phone, text or email a friend and ask how to do it.
    c. unpack the box and start putting the pieces together.
    d. follow the diagrams that show how it is done.

34. You need to give directions to go to a house nearby. I would:
    a. walk with them.
    b. draw a map on a piece of paper or get a map online.
    c. write down the directions as a list.
    d. tell them the directions.

35. You have a problem with your knee. Would you prefer that the doctor:
    a. showed you a diagram of what was wrong.
    b. gave you an article or brochure that explained knee injuries.
    c. described to you what was wrong.
    d. demonstrated what was wrong using a model of a knee.

36. A new movie has arrived in town. What would most influence your decision to go (or not go)?
    a. you hear friends talking about it.
    b. you read what others say about it online or in a magazine.
    c. you see a preview of it.
    d. it is similar to others you have liked.

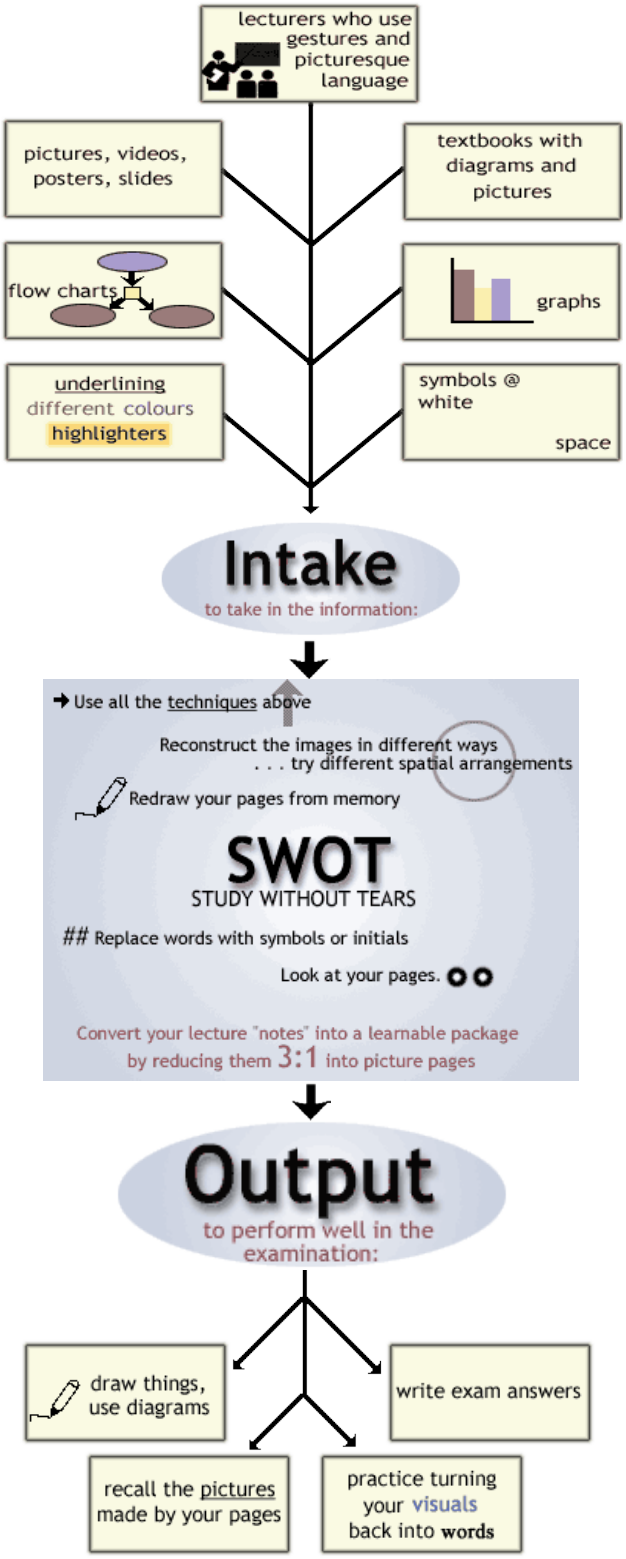
37. Do you prefer a teacher who likes to use:
    a. demonstrations, models or practical sessions.
    b. class discussions, online discussion, online chat and guest speakers.
    c. a textbook and plenty of handouts.
    d. an overview diagram, charts, labelled diagrams and maps.

38. You are learning to take photos with your new digital camera or mobile phone. I would like to have:
    a. examples of good and poor photos and how to improve them.
    b. clear written instructions with lists and bullet points.
    c. a chance to ask questions and talk about the camera's features.
    d. diagrams showing the camera and how to use it.

39. You want some feedback about an event, competition or test. I would like to have feedback:
    a. that used examples of what I have done.
    b. from somebody who discussed it with me.
    c. that used a written description or table of my results.
    d. that used graphs showing what I achieved.

40. You have to present your ideas to your class. I would:
    a. make diagrams or get graphs to help explain my ideas.
    b. write a few key words and practice what to say again an again.
    c. write out my speech and learn it by reading it again and again.
    d. gather examples and stories to make it real and practical.

Appendix B: Visual Study Strategies



Appendix C: Aural Study Strategies

If you have a strong preference for learning by **Aural** methods (**A** = hearing) you should use some or all of the following:

INTAKE

To take in the information:

- attend classes
- attend discussions and tutorials
- discuss topics with others
- discuss topics with your teachers
- explain new ideas to other people
- use a tape recorder
- remember the interesting examples, stories, jokes...
- describe the overheads, pictures and other visuals to somebody who was not there
- leave spaces in your notes for later recall and 'filling'

SWOT - Study without tears

To make a learnable package:

Convert your "notes" into a learnable package by reducing them (3:1)

- Your notes may be poor because you prefer to listen. You will need to expand your notes by talking with others and collecting notes from the textbook.
- Put your summarized notes onto tapes and listen to them.
- Ask others to 'hear' your understanding of a topic.
- Read your summarized notes aloud.
- Explain your notes to another 'aural' person.

OUTPUT

To perform well in any test, assignment or examination:

- Imagine talking with the examiner.
- Listen to your voices and write them down.
- Spend time in quiet places recalling the ideas.
- Practice writing answers to old exam questions.
- Speak your answers aloud or inside your head.

Appendix D: Read/Write Study Strategies

If you have a strong preference for learning by **Reading** and **Writing (R & W)** learning you should use some or all of the following:

INTAKE

To take in the information:

- lists
- headings
- dictionaries
- glossaries
- definitions
- handouts
- textbooks
- readings - library
- notes (often verbatim)
- teachers who use words well and have lots of information in sentences and notes
- essays
- manuals (computing and laboratory)

SWOT - Study without tears

To make a learnable package:

Convert your "notes" into a learnable package by reducing them (3:1)

- Write out the words again and again.
- Read your notes (silently) again and again.
- Rewrite the ideas and principles into other words.
- Organize any diagrams, graphs ... into statements, e.g. "The trend is..."
- Turn reactions, actions, diagrams, charts and flows into words.
- Imagine your lists arranged in multiple-choice questions and distinguish each from each.

OUTPUT

To perform well in any test, assignment or examination:

- Write exam answers.
- Practice with multiple choice questions.
- Write paragraphs, beginnings and endings.
- Write your lists (a,b,c,d,1,2,3,4).
- Arrange your words into hierarchies and points.

Appendix E: Kinesthetic Study Strategies

If you have a strong **Kinesthetic** preference for learning you should use some or all of the following:

INTAKE

To take in the information:

- all your senses - sight, touch, taste, smell, hearing ...
- laboratories
- field trips
- field tours
- examples of principles
- lecturers who give real-life examples
- applications
- hands-on approaches (computing)
- trial and error
- collections of rock types, plants, shells, grasses...
- exhibits, samples, photographs...
- recipes - solutions to problems, previous exam papers

SWOT - Study without tears

To make a learnable package:

Convert your "notes" into a learnable package by reducing them (3:1)

- Your lecture notes may be poor because the topics were not 'concrete' or 'relevant'.
- You will remember the "real" things that happened.
- Put plenty of examples into your summary. Use case studies and applications to help with principles and abstract concepts.
- Talk about your notes with another "K" person.
- Use pictures and photographs that illustrate an idea.
- Go back to the laboratory or your lab manual.
- Recall the experiments, field trip...

OUTPUT

To perform well in any test, assignment or examination:

- Write practice answers, paragraphs...
- Role play the exam situation in your own room.

Appendix E: Multimodal Study Strategies

If you have multiple preferences you are in the majority as approximately 60% of any population fits that category.

Multiple preferences are interesting varied. For example you may have two strong preferences V and A or R and K, or you may have three strong preferences such as VAR or ARK. Some people have no particular strong preferences and their scores are almost even for all four modes. For example one person had scores of V=6, A=6, R=6, and K=6. She said that she adapted to the mode being used or requested. If the teacher or supervisor preferred a written mode she switched into that mode for her responses and for her learning.

So multiple preferences give you choices of two or three or four modes to use for your interaction with others. Positive reactions mean that those with multimodal preferences choose to match or align their mode to the significant others around them. But, some people have admitted that if they want to be annoying they may stay in a mode different from the person with whom they are working. For example they may ask for written evidence in an argument, knowing that the other person much prefers to refer only to oral information.

If you have two almost equal preferences please read the study strategies that apply to your two choices. If you have three preferences read the three lists that apply and similarly for those with four. You will need to read two or three or four lists of strategies. One interesting piece of information that people with multimodal preferences have told us is that it is necessary for them to use more than one strategy for learning and communicating. They feel insecure with only one. Alternatively those with a single preference often "get it" by using the set of strategies that align with their single preference.

We are noticing some differences among those who are multimodal especially those who have chosen fewer than 25 options and those who have chosen more than 30. If you have chosen fewer than 25 of the options in the questionnaire you may prefer to see your highest score as your main preference - almost like a single preference.

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14. ABSTRACT

Millennial generation recruits are entering the Air Force and with them come their new attitudes and expectations. As a result, the leadership of the Air Education and Training Command (AETC) expressed a need for information on how to effectively train this new generation of recruits in their 2008 whitepaper. The purpose of this thesis was to begin to address this requirement by investigating the influence video gaming has on the learning preferences of trainees undergoing initial technical training at the 82nd Training Wing, Sheppard Air Force Base, Texas. A survey was administered and data was collected from 866 trainees. The survey included measures for age, video gaming experience, individual data format preferences (as measured by the Visual, Auditory, Read/Write, and Kinesthetic (VARK) questionnaire), goal orientation, motivation to learn, and performance self assessment ratings.

The results showed that video gaming experience was not significantly related to the subjects' preferred learning style. However, correlations between the learning preferences and motivation to learn constructs indicated that none of the VARK categories were significant motivated in the current learning environment. Additionally, goal orientation was also shown to have a significant influence on motivation to learn. Therefore, increased goal orientation will have a profound influence on training motivation in the current training environment.

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