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1. REPORT DATE (DD-MM-YYYY) 18-04-2020	2. REPORT TYPE Master of Military Studies (MMS) thesis	3. DATES COVERED (From - To) AY 2019-2020
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4. TITLE AND SUBTITLE Generational Learning in the Marine Corps: The Importance of Information Age Thinking	5a. CONTRACT NUMBER N/A
	5b. GRANT NUMBER N/A
	5c. PROGRAM ELEMENT NUMBER N/A

6. AUTHOR(S) Bower, James D.	5d. PROJECT NUMBER N/A
	5e. TASK NUMBER N/A
	5f. WORK UNIT NUMBER N/A

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) USMC Command and Staff College Marine Corps University 2076 South Street Quantico, VA 22134-5068	8. PERFORMING ORGANIZATION REPORT NUMBER N/A
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9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S) N/A

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The 38th Commandant of the Marine Corps (CMC), General David H. Berger, stated in the 2019 Commandant's Planning Guidance that education and training is one of the five priority areas requiring a targeted focus of effort. Both the US National Defense Strategy and National Security Strategy emphasize that training and education are important to readiness, lethality and ingenuity. The CPG raises concerns with schoolhouses and instructors shifting, within the training and education continuum, from an industrial age model in teaching methodologies and curriculum to an information age model. CMC guidance further contends that the entire formal schools management system requires an overhaul when making the transformation. All three documents also describe the challenges China presents to US security, infrastructure, and economic stability. The CMC described the Corps' need to deploy forward to deter Chinese activities as another top priority for Marines. One could assume if situations escalate in the South China Sea, the demand for critical Chinese language speakers may increase, based on the historical need for linguists during conflicts. It is important to understand the CMC's education concerns and assess the Chinese language program at the Defense Language Institute (DLI), where Marines are trained, to determine if information age models can be instituted to improve the learning process for Marine linguists and increase their chances for swift, successful course completion. The transition to an information age model will require a more nuanced appreciation of differences in generational teaching and learning preferences as well as the impact on language resources, the culture of DLI, and how information age instruction is currently being implemented at DLI.

15. SUBJECT TERMS
Commandant's Planning Guidance (CPG); China; Chinese language; linguist; Defense Language Institute (DLI)

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			USMC Command and Staff College
Unclass	Unclass	Unclass	UU		19b. TELEPHONE NUMBER (Include area code) (703) 784-3330 (Admin Office)

*United States Marine Corps
Command and Staff College
Marine Corps University
2076 South Street
Marine Corps Combat Development Command
Quantico, Virginia 22134-5068*

MASTER OF MILITARY STUDIES

**TITLE: GENERATIONAL LEARNING IN THE MARINE CORPS: THE
IMPORTANCE OF INFORMATION AGE THINKING**

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

AUTHOR: Mr. James D. Bower

AY 19-20

Mentor and Oral Defense Committee Member: Dr. Lauren Mackenzie
Approved: //Signed//
Date: April 9, 2020

Oral Defense Committee Member: LtCol Jude Shell
Approved: //Signed//
Date: April 9, 2020

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Preface

Changing the Marine Corps' culture from an industrial age to an information age is a daunting undertaking proposed by the Commandant in his 38th Commandant's Planning Guidance. This change implies the need for a paradigm shift in how Marines think when approaching the future. The current environment where fiscal constraints were offset with overseas contingency operations (OCO) funds is not a fiscal environment America can sustain. It requires a different mindset. Depending on OCO has been the norm since 2001, nearly an entire career for an enlisted Marine. It has created an environment of unmanageable and unaffordable requirements, laced with legacy systems, paralyzing an establishment unwilling to divest in programs that may be needed until a new program comes along. Therein lies the problem. There are not enough resources to both sustain and to modernize. Trade-offs must be carefully considered with intelligent, capable transition plans to ramp down older systems and processes, while ramping up new methodologies, training approaches and equipment sets all while keeping Marines mission capable. The entire Marine Corps must work together to determine priorities and innovate creative ways to forge ahead. One method is to look at entry level schools and see where opportunities lie to cut the training pipeline and institute smart changes that will maximize the abilities our information age digital natives.

Foremost I would like to thank Dr. Lauren MacKenzie for her dedication, foresight, and assistance in providing outstanding guidance, and academic acumen through my writing process. I am grateful for her insights and expertise in the aspects of examining culture. I also greatly appreciate Col Dave Burton and the Marine Corps Systems Command leadership who afforded me this opportunity. Next, I would like to thank Lt. Col Jude Shell for his assistance, and insights concerning DLI and its interaction with the Marine Corps Detachment. A special thanks goes to Dr. John Gordan, Dr. Jorge Benitez, and LtCol Zach Anthony for their mentorship throughout the program. The insights and meticulous reviews provided by Brandy Lyn Brown and Andrea Hamlin were most welcome and invaluable. I am extremely grateful to Ms. Karen Foster, Director of Secondary Education Caroline County Public Schools, who provided me assistance on brain chemistry, the impacts of stress, and understanding generational challenges in the education system. I appreciate CWO5 Mike Kuker for his friendship, and assistance with understanding the formal school environment. I greatly appreciate Mr. John Durish, MSgt Ann Sagebiel and Mr. Ray H. Gigliotti from HQMC Intelligence Department Foreign Language Program for their time and inner workings of the Marine Corps language program, which greatly enhanced my novice-level knowledge in this field. I appreciate Lt Col Jason Schermerhorn, for providing background information concerning the Marine Detachment at DLI. Thank you, Jack Donnelly, Chief, SOF Language & Education Branch for all your input and data you provided. Ms. Vicky Sweeney, Contractor Team Yorktown Education Division; Special Operations Forces Language Branch also provided insightful information. I would also like to thank Mr. Youssef Carpenter from DLI for his assistance. Finally, I would like to thank both my sons, Senior Airman Aaron Bower, who graduated DLI as a Spanish Linguist, and Lance Corporal Hamish Bower, who endured 11 months of Mandarin Chinese at DLI. Both provided insights, related their experiences, and provided a window into to millennials and Generation Z thinking. Their DLI struggles helped me formulate the idea to research this topic. A special thanks goes to my wife Susie, a Marine wife whose understanding and sacrifices know no bounds.

Executive Summary

Title: Generational Learning in the Marine Corps: Importance of Information Age Thinking

Author: Mr. James D. Bower, United States Marine Corps, AY2019-2020

Thesis: This paper examines the CMC's call to transition from industrial age to information age thinking and argues for the importance of this change at the Defense Language Institute (DLI). The transition to an information age model will require a more nuanced appreciation of differences in generational teaching and learning preferences as well as the impact on language resources, the culture of DLI, and how information age instruction is currently being implemented at DLI. The paper reviews several best practices in language teaching and learning and suggests how some information age generational learning models might be applied to improve Generation Z (also referred to as Gen Z or Zoomers) Marine's chances for success at DLI.

Discussion: Generation Z (Gen Z) digital natives, who grew up in the digital age consume information and approach learning differently than Generation X, Y, or Baby Boomers. The Systems Approach to Training (SAT) is a model widely used throughout military formal schooling and dictates strict framework of how to conduct training.¹ The author recalls using SAT upon entering service in the 80's. The SAT is an industrial age approach that must be adapted to make learning techniques relevant to the information age of entry level Marines. This first building-block, if done correctly, can stimulate and impact the development of each student's technical proficiency, not only during MOS training but also in sustainment learning activities for the rest of their career.

Conclusion: Instituting information age change in an organization is challenging when trying to institute a new paradigm across a wide cultural divide, especially in a joint environment. The Commandant expects information age thinking to enhance environments where creativity and innovation take on new life through fostering a digital mindset. The military comprises many different individuals from all parts of the country and foreign countries as well. When coupled with vast differences in generational culture, changing culture becomes more complex. However, leaders and subordinate Marines alike have been called to action by the Commandant to institute change and embrace the information age. This requires courage and dedication to foster growth, exploit opportunities to institute dynamic new practices, and to commit to making a change. Gen Z opens the doors to new possibilities, as their world expects change and fluidity. Their information age mindset identifies the art of the possible and connects information through brands and influencers to consider change. Implementing informational age learning models in formal schools, like DLI, is technically feasible. DLI's current methodologies are ripe for change and could embrace more of an information age learning model. The Corps must adapt and overcome its industrial mindset to join the 21st century. The CMC highlighted the digital battlefield. Information age warriors are ready and want to engage.

I. Introduction

The 38th Commandant of the Marine Corps (CMC), General David H. Berger, stated in the *2019 Commandant's Planning Guidance* that education and training is one of the five priority areas requiring a targeted focus of effort.² Both the *US National Defense Strategy*³ and *National Security Strategy*⁴ emphasize that training and education are important to readiness, lethality and ingenuity. The CPG raises concerns with schoolhouses and instructors shifting, within the training and education continuum, from an industrial age model in teaching methodologies and curriculum to an information age model. CMC guidance further contends that the entire formal schools management system requires an overhaul when making the transformation.⁵ All three documents also describe the challenges China presents to US security, infrastructure, and economic stability. The CMC described the Corps' need to deploy forward to deter Chinese activities as another top priority for Marines. One could assume if situations escalate in the South China Sea, the demand for critical Chinese language speakers may increase, based on the historical need for linguists during conflicts.⁶ It is important to understand the CMC's education concerns and assess the Chinese language program at the Defense Language Institute (DLI), where Marines are trained, to determine if information age models can be instituted to improve the learning process for Marine linguists and increase their chances for swift, successful course completion. The transition to an information age model will require a more nuanced appreciation of differences in generational teaching and learning preferences as well as the impact on language resources, the culture of DLI, and how information age instruction is currently being implemented at DLI.

This paper examines the CMC's call to transition from an industrial to an information age learning model and argues for the importance of this change at the DLI. After reviewing several

best practices in language teaching and learning, recommendations will be offered to suggest how some information age generational learning models might be applied to improve Generation Z (also referred to as Gen Z or Zoomers) Marine's chances for success at DLI. This paper will also explore the criticality of linguists and the strenuous process entry level Marines face, demographics and characteristics of Gen Z Marines, and finally, the paper explores the impact of culture on teaching and learning and its connection to Marine success at DLI. The paper concludes with considerations for implementing generational learning in formal schools.

II. Literature Review

Transitioning from an industrial age model to an information age model in a formal school environment entails a cultural paradigm shift. In order to explore how information age thinking aligns with generational characteristics, this paper will explore literary works concerning the best practices for teaching the Chinese language, digital language learning technologies, and methodologies for teaching Gen Z. The following literature review also examines the critical nature of language skills for Marines and their impact on Marine Corps resources.

The articles used to explore the industrial age model and compare it to the information age model typically begin by defining the age ranges and characteristics that are associated with each generation. This helps to delineate how each generation thinks and approaches learning to show the progression from 1900's industrial age thinking through today's information age. Major David Rosenbrock⁷ studied the impacts of Generation Z on Marine Corps recruiting and constructed a table which is helpful in summarizing the period of years corresponding to each generation as described through various resources as seen below:

Generations by Start and End Dates

Source	PEW ⁵	Wiedmer ⁶	Bencsik ⁷	Tuglan ⁸	Southgate ⁹	Desai ¹⁰
Silent/Traditionalist	1928-1945	1900-1945	1925-1946	pre-1946	—	1928-1945
Baby Boomer	1946-1964	1946-1964	1946-1960	1946-1964	—	1946-1964
Gen X	1965-1980	1961-1981	1960-1980	1965-1977	1967-1981	1965-1980
Gen Y (Millennial)	1981-1996	1980-1990	1981-1994	1978-2000	1982-1996	1981-1989
Gen Z	—	1995-2015	1995-2010	2001-TBD	1997-2011	1990-2017

Figure 1. Generation Time Periods.

Source: David E. Rosenbrock, “The Impact of Generation Z on Marine Corps Recruiting,” (master’s thesis, Marine Corps University, 2018), 3., https://usmc.primo.exlibrisgroup.com/view/delivery/01USMCU_INST/1246426970005241.

Based on his table, this paper will refer to Generation Z (Gen Z) as summarized from years covering these consolidated ranges in age from 5 to 25 years old, with Gen Y ranging from 26-40. McCrindle’s Research show characteristics of each the industrial age reflect a period of strict learning through a regimented, methodical approach; whereas information age traits appear open to the possibilities of free-form exploration.⁸ These assertions are reinforced by Bernie Trilling and Paul Hood’s generational comparisons in how students approach learning. The conclusions of both works distinctly show how students’ minds have progressed.

Mr. John Durish, Headquarters Marine Corps Foreign Language Program Manager, researched language criticality and the process of creating a Marine Corps linguist to show the difficulty and cost in training and educating an entry-level Marine. He explained the history of why linguists are important to the Marine Corps and proposed questions and challenges concerning language learning and the inability of machine learning and artificial intelligence to replace Marine linguists.⁹ His ideas spurred further research into exploring what digital technologies are the best practices in learning Chinese. Research shows progression in virtual reality, augmented reality and virtual worlds where artificial intelligence can assist, but not replace linguists. This paper expounds on his work by exploring digital tools that may increase the possibilities of improving language learning methodologies.

David Stillman and Jonah Stillman's book *Gen Z at Work*, as well as works from Dr. Vicki Cook at the University of Illinois Springfield provide critical insights to the Gen Z mindset. Understanding that Gen Z sees no difference between existing in a physical world and an online digital world, calling their world phigital (physical/digital) explains a lot about the psyche of the information age mindset. This blending of worlds explains the Gen Z culture and shows how it opens the possibilities to creativity and innovation by not limiting one's boundaries. The phigital landscape, when coupled with digital technologies, provides opportunities to reshape the formal school environment.

Finally, the DLI culture as described in the *Defense Language Institute Foreign Language Center (DLIFLC) Institution Self Evaluation Report 2017*¹⁰ illustrates challenges and issues experienced at the schoolhouse, which frames the problems set forth in this paper. The report demonstrates industrial age influences remain, but there is a desire to change to information age technologies. The report makes several references to difficulties in updating both the curriculum and instructor training. The DLIFLC self-evaluation authors propose change is hampered by fiscal constraints and personnel shortfalls. Those are not the only limitations.

The use of language and the industrial age structure used to frame issues and evaluations in the DLIFLC report appears limited in understanding the information age environment. The first information age example of a digital improvement was the issue of MacBooks hardware in the French course, which is required for Gen Z learning, but information age improvements seem to stagnate as the report progresses.¹¹ Other examples of technology improvements are the initiation of the Sakai Learning Management Service, SharePoint, and updated Smart Boards.¹² While these examples may seem like emerging technology to the DLIFLC authors, Sakai was released in 2005,¹³ SharePoint in 2001,¹⁴ and Smartboards in 1991.¹⁵ Smartboards are older than

Gen Z. The DLIFLC self-evaluation report examines change, but not specifically geared toward the information age.

The DLIFLC self-evaluation report is also used to determine how the schoolhouse can institute change; however, these changes appear to be self-determined without external influence. Research from surveys and evaluations is conducted internally in a closed environment. The self-evaluation report says the schoolhouse conducts student surveys at the beginning of a student's language course, periodically throughout the student's journey, and at the end of the course. The DLIFLC authors stated that "results are used in program-level and institution-wide planning to evaluate how well the institution fulfills its mission, to determine needed changes, to allocating resources, and to make improvements," as well as to gauge student feedback form quality of life to the learning environment.¹⁶ It is difficult to institute new learning methods or make information age changes if no external research is considered to compare to one's self. It appears the only changes being considered are the ones brought to DLI's attention. The survey shows there are external requirements from stakeholders, and one single case of an external curriculum review of the Levantine Dialect Program, but no formal process to enact an external evaluation of the effectiveness of language learning techniques or learning models to improve learning.¹⁷

Both the military and DLI cultures present critical shortfalls and challenges for 18 to 23-year-old students who are learning how to be a Marine, how to live away from home and how to survive in a learning environment akin to master's level course. Students are in class six to seven hours per day, five days per week, with another one to four hours of homework. The time it takes to complete homework is dependent on the skill level of the learner; those who struggle take longer. Students reported various methodologies to improve their learning and proficiency

from the use of flashcards to listening to language in the shower.¹⁸ Chinese is described by students as extremely difficult due to the sheer amount of information given to the student coupled with the fast pace of learning. One student equated one week of DLI learning to one semester of normal college learning. Typical proficiency success rates are 75% at DLI, but for military students who take Chinese, the success rate is 95%.¹⁹ The 95% does not account for students who are dropped prior to taking the Defense Language Proficiency Test (DLPT), only for those who complete the language portion and achieve their proficiency rating, meaning 5% who complete the course still do not become Chinese linguists. DLI reported a 79 % completion rate in 2012 and a 78% completion rate in 2016. Attrition due to administrative actions was 10%, while another 12% was due to academic drops.²⁰ Therefore, 22% of expected linguists fall short of service goals for this critical skillset annually for the past five years.

III. Language Criticality and the Challenge to Resources

Linguists continue to be a critical requirement of the Marine Corps as demonstrated through operational requirements, recruiting, and efforts to retain Marines with these skills. Marines demands for foreign language skills have shown an increase since 2003 as evidenced by CMC General Michael W. Hagee in All Marine Message 072/03. He stated that battlefield success impinges on the Corps' ability to meet essential operational tasks performed by linguists, specifically, "situational awareness, intelligence operations, civil affairs programs, and the interaction with coalition forces and local populations."²¹ These tasks are not the only mission areas where linguists are necessary for battlefield success. Since 2003, vital language skills in the cyber realm have increased. A recent Rand study demonstrated that the mission

effectiveness of Marine cyber warriors requires a large capacity of trained linguists to sift through foreign language content, making these skills more critical than ever.²²

Getting linguists in the Corps is a long and difficult process. Recruiters assess each candidate with a desire for language skill with the Defense Language Aptitude Battery (DLAB) test, to ensure the potential for success in a foreign language. The DLAB is also a prerequisite for getting into the DLI where each entry level linguist learns their language. After recruiting, a language candidate may be discovered at boot camp. Native foreign language speaker recruits are afforded an opportunity to take the DLPT in recruit training. If a recruit scores within acceptable proficiency levels to rate being re-assigned as a linguist, the recruit may either forgo DLI and ship directly to a unit or sent to DLI. After a Marine achieves their linguist MOS, the Marine Corps shows it understands the criticality for linguists by ensuring they are paid for their efforts by providing proficiency pay between \$100 to 1000 per month based on each Marine's fluency in a language or languages.²³ These bonuses also help toward retention.

The Corps could gain time and resource efficiencies by instituting information age teaching methods and get mission critical linguists to the fleet faster. Getting the necessary resources and enough candidates for language skills can prove to be difficult. A Top-Secret sensitive compartmentalized information clearance is required to work as a linguist.²⁴ Clearance paperwork is both time consuming and expensive. The entry level cost for learning Chinese costs \$480,000 per student as reported by the Government Accounting Office in 2017 dollars.²⁵ But funding is not the only challenge. Languages are broken down into different categories based on the difficulty, which range from Category I²⁶ as the easiest language to learn and requires a DLAB score of 95, up to a Category IV and DLAB 110 score. Chinese Mandarin is a Category IV language and takes 64 weeks of study for the basic program.²⁷ After taking the

course, the student must gain a proficiency to meet the MOS linguist standards and then pass the DLPT. Upon graduating DLI, the language proficient student must attend another school to learn Cryptologic Language Analyst skills to join the Signals Intelligence (SIGINT) community with a second MOS. By the time a Marine learns the most basic SIGINT skills, the Marine Corps gets approximately another three years return on investment. Hefty reenlistment bonuses try to entice a Marine to continue with their service; however, the demand for linguists in the civilian sector is also tempting. The faster a Marine can learn Chinese and get to the fleet, the more the Corps will recoup on both time and money invested on this critical skillset. Not only is the process lengthy, it is also extremely stressful to the Marine student. The author's son went through this process, he commented that he felt personally responsible to spend as many hours as it took to learn Chinese as it was critical to the needs of the Corps. He also remarked on the struggle within the DLI culture in trying to balance service requirements with homework and expectations.

IV. Marine Corps Generational Demographics

To find efficiencies in shifting to an information age model, it is paramount to analyze Marine Corps demographics by age and rank to determine how changes will impact the population. This data shows the population potentially affected by making entry-level educational changes.

Age	Marine Corps	
	Enlisted	Officers
25 Years or Younger	73.6%	17.0%
26 to 30 Years	12.8%	25.2%
31 to 35 Years	7.3%	22.3%
36 to 40 Years	4.2%	17.3%
41 Years or Older	2.1%	18.3%
Total	100.0%	100.0%

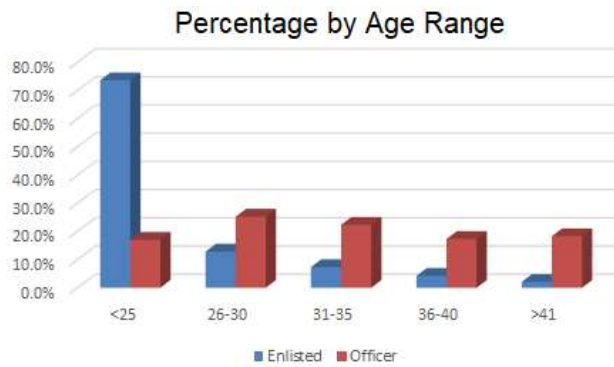


Figure 2. Marine Corps Population by Age Range

Source: Department of Defense, *2018 Demographics: Profile of the Military Community* (Washington, DC: Department of Defense, 2018), 15, 39, <https://download.militaryonesource.mil/12038/MOS/Reports/2018-demographics-report.pdf>.

According to the 2018 Department of Defense demographics report, the following chart graphically displays Marine Corps percentage of the population by age in both officer and enlisted ranks.²⁸ It overwhelmingly shows 73.6% of the entire enlisted Marines population are Generation Z (Gen Z), or Zoomers, as well as 17% of the officers. It also shows nearly 48% of officers and 20% enlisted Marines are millennials. This data suggests most Marine personnel exist in digital native age ranges; however, generationally, more officers may identify with millennial influences rather than Gen Z perspectives. This is important when considering the age of instructors and if teachers use older methodologies to present course material to the Gen Z student. The Gen Z, under 25 years old age range, is where most education and training in formal schools occurs for entry level and intermediate level learning. Understanding how to optimize Gen Z learning, is important because the largest amount of learning and money spent on training occurs as Marines enter military service to gain technical proficiency within their newly assigned MOS. When the data is broken down by rank as shown in Figure 3, it provides more details on entry level Marines.

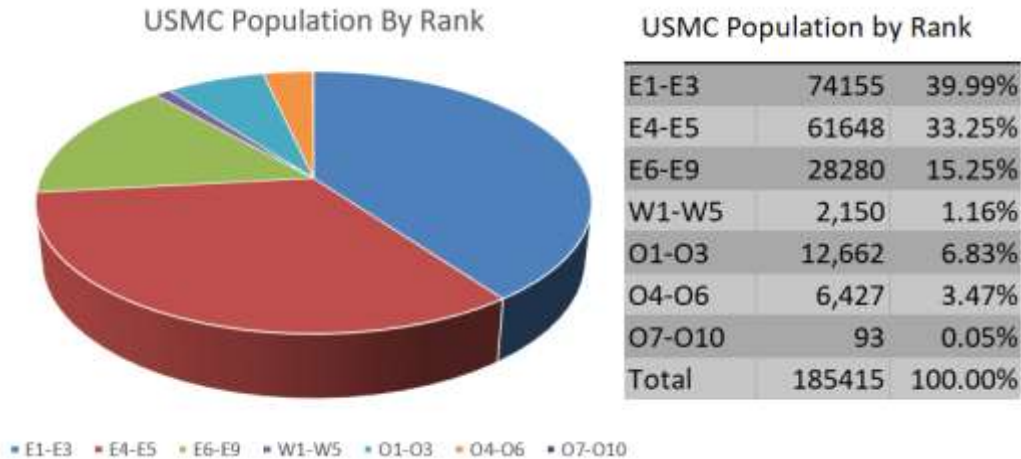


Figure 3, USMC Population by Rank

Source: Department of Defense, *2018 Demographics: Profile of the Military Community* (Washington, DC: Department of Defense, 2018), 15, 39, <https://download.militaryonesource.mil/12038/MOS/Reports/2018-demographics-report.pdf>.

Lance Corporals and below make up approximately 40% of the Marine Corps' total population. These Gen Z Marines will enter one of the 76 formal schools within the Marine Corps Training Command,²⁹ or attend joint schools run by other services and agencies. While this paper only focuses on the DLI formal school, it is easy to imagine how much time and money is spent during entry level training. Focusing efforts on maximizing training for the 40% can potentially reduce the amount of time spent in school, get Marines to the fleet more expeditiously, and free up resources to reallocate in other critical areas in the operating forces.

V. Generational Learning Perspectives

In shifting from an industrial age model to an information age model, teaching practices must align with generational learning preferences to grab a student's attention and maximize their focus, which will increase their comprehension. Classifying all generations into these age-

defined characteristic-based generalities is not always accurate due to stereotyping precepts; there will always be exceptions where this model does not hold true.³⁰ However, there are many notable differences when contrasting Marines generationally, which provides insight on how digital age thinking evolved. Mccrindle Research provides a snapshot of this evolution below by showing the correlation between technology, learning and how each generation is inspired.³¹

	Builders 1925-1945 Aged 70s - 80s	Baby Boomers 1946-1964 Aged 50s - 60s	Generation X 1965-1979 Aged 30s - 40s	Generation Y 1980-1994 Aged 20s - early 30s	Generation Z 1995-2010 Aged kids - teens
Iconic Technology	Radio (wireless) Motor Vehicle Aircraft	TV (56) Audio Cassette (62) Transistor radio (55)	VCR (76) Walkman (79) IBM PC (81)	Internet, Email, SMS DVD (95) Playstation, Xbox, iPod	MacBook, iPad Google, Facebook, Twitter Wii, PS3, Android
Influencers	Authority Officials	Evidential Experts	Pragmatic Practitioners	Experiential Peers	User-generated Forums
Training Focus	Traditional On-the-job Top-down	Technical Data Evidence	Practical Case studies Applications	Emotional Stories Participative	Multi-modal eLearning Interactive
Learning Format	Formal Instructive	Relaxed Structured	Spontaneous Interactive	Multi-sensory Visual	Student-centric Kinesthetic
Learning Environment	Military style Didactic & disciplined	Classroom style Quiet atmosphere	Round-table style Relaxed ambience	Cafe-Style Music & Multi-modal	Lounge room style Multi-stimulus
Sales & Marketing	Print & radio Persuasive	Mass / Traditional media Above-the-line	Direct / Targeted media Below-the-line	Viral / Electronic Media Through Friends	Interactive campaigns Positive brand association
Purchase Influences	Brand emergence Telling	Brand-loyal Authorities	Brand switches Experts	No Brand Loyalty Friends	Brand evangelism Trends
Financial Values	Long-term saving Cash No credit	Long-term needs Cash Credit	Medium-term Goals Credit savvy Life-stage debt	Short-term wants Credit dependent Life-style debt	Impulse purchases E-Stores Life-long debt
Ideal Leaders	Authoritarian Commanders	Commanding Thinkers	Co-ordinating Doers	Empowering Collaborators	Inspiring Co-creators

Figure 4. Generational Thought Comparison Matrix

Source: Mccrindle Research, “Generations Defined,” last modified 2018, but truncated by writer from <https://mccrindle.com.au/wp-content/uploads/2018/03/Generations-Defined-Sociologically.pdf>.

This side-by-side view is important to understand how growth and change has shaped digital native’s abilities to learn. Comparing radios in 1925 to personal computing devices available today, one can see the progression from the industrial age to the information age in the way

students utilize complex technology, and the opportunity for access to vast arrays of worldwide content. This narrow to broad expansion also shows how education progressed. When viewing the learning style of the industrial model, one can see how industrial age thinking was shaped by a formal and structured classroom style. Teachers are authoritarian experts who present data and evidence in a quiet, but disciplined atmosphere. When compared to the information age thinker, the industrial age model appears antiquated. Information age students require a model of multi-stimulus, student-centric kinesthetic learning where they are allowed freedom of action both inside and outside the classroom. Kinesthetic learning requires teachers to allow the students the opportunity to get up from the traditional static classroom and allow their students to experience learning through freedom of action. Education consultant Dr. Eric Jensen supports the kinesthetic environment. His studies show that “when students are allowed to move, fidget, rock, lean, stand, etc., they are more alert, more focused, and helps them to get rid of excess energy.”³² This observation accounts for fidgety students who don’t do well, sitting for long periods without movement. These behaviors facilitate comprehension through explorative, engaging classroom activities to maximize the potential for grasp complex thought.³³ Bernie Trilling and Paul Hood³⁴ further explore the paradigm shift in the education process in Figure 5.

Industrial Age	Knowledge Age (Information age)
Teacher-as-Director	Teacher-as-Facilitator, Guide, Consultant
Teacher-as-Knowledge Source	Teacher-as-Co-learner
Curriculum-directed Learning	Student-directed Learning
Time-slotted, Rigidly Scheduled Learning	Open, Flexible, On-demand Learning
Primarily Fact-based	Primary Project & Problem-based
Theoretical, Abstract, Principles & Surveys	Real-world, Concrete Actions & Reflections
Drill & Practice	Inquiry & Design
Rules & Procedures	Discovery & Invention
Competitive	Collaborative
Classroom-focused	Community-Focused
Prescribed results	Open-ended Results
Conform to Norm	Creative Diversity

Computers as subject of study	Computers-as-a-Tool for all learning
Static Media Presentations	Dynamic Multimedia Interactions
Classroom-Bounded Communication	Worldwide-unbounded Communication
Test-assed by Norms	Performance-Assessed by Experts, Mentors, Peers, & Self

Figure 5. Industrial age/Information age Education Environments

Source: Bernie Trilling and Paul Hood, “Learning, Technology, and Education Reform in the Knowledge Age or We’re Wired, Webbed, And Windowed, Now What?”, *Educational Technology*, (May-June 1999), 11, http://www.indiana.edu/~syschang/decaturo/documents/07_trilling.pdf.

Their research shows industrial age methodology as a regimented, structured, linear pathway for teachers to present course material to students. The industrial age student sits in class and is presented a lesson from an expert. The pupil learns through rules, then performs drills on the subject matter, and is finally tested on knowledge presented to ensure the student has learned. This methodology also presents a framework and pattern of how the industrial mind processes thought. Industrial thought flows through a logical and orderly manner. When compared to the open, flexible, and unbounded mindset of a Gen Z learner, it shows how digital thought is not tied to a formulaic approach.

The randomness and openness of a digital native appears to open the possibilities to innovation, creativity, and critical thinking. Gen Z students use computers and other digital mediums to adapt their learning methods. The Gen Z perception of teachers is to provide a conduit to guide learning and foster self-discovery as students explore the course material both in and out of the formal classroom. Gen Z students desire a forum and digital methodologies to explore content and collaborate on their discoveries. As the student formulates thought, the student’s knowledge is presented and assessed by the teacher and by their peers. This process reinforces or resets ideas to adjust what they’ve learned.

The Gen Z mindset exists in two worlds at once, the physical world and the digital world, which shapes how they approach life. The Zoomer world is expressed as phigital, meaning for

every physical element that exists, a digital equivalent also exists. For example, there is no difference between shopping in a brick and mortar store or shopping online. In the workplace, Gen Z sees no difference in attending a meeting on Skype, or in person around a table; both methods are acceptable and provide access, and interaction for participation.³⁵ This phigital existence as a Gen Z norm must be translated to educational models in formal schools.

VI. Generation Z Learning Characteristics

Gen Z learning stems from the Gen Z culture of how they approach society and formulate thought. Gen Z has grown up with smart technology, which means they have content and information immediately available at their fingertips. This does not mean Zoomers are always impatient and need a data source with them, it means it's normal for them not to wait for information and to explore a thought, because they don't have to wait.³⁶ Statistics show this generation has definitive characteristics that impact their learning and thought processes.

Responsible – 60% want their jobs to impact the world; 26% regularly volunteer in some capacity³⁷

Entrepreneurial – 72% envision starting a business someday; 76% wish a hobby could be their job³⁸

Connected – 95% have smartphones; 55% use phone 5 hours/day; 26% 10 or more hours/day³⁹

Multi-taskers – Avg attention span is 8 seconds; Able to ingest 5 screens at once⁴⁰

Diverse – 77% says a company's level of diversity affects their decision to work there⁴¹

Curious Learners – 46% follows 10 influencers or more; 73% follow one brand; 52% three or more⁴²

Hyper-Customized – Displays their personal brand via imagery, data feeds and content⁴³

Custom Education – 72% want colleges to let students design their own course of study and major⁴⁴

Figure 6. Gen Z Character Statistics

Source: Compiled by Author from various sources shown in the chart endnotes

Gen Z sees themselves as respectful, responsible, hard-working, creative and smart; they build a network to validate these characteristics through hyper-customizable interfaces with like-minded individuals they follow and interact with. 88% say following brands and influencers is a means to find authentic subject matter experts who care about their interests or fun and exciting visual means while they learn about topics interesting to them.⁴⁵ It is not only searching for a brand to identify with, but establishing their own brand or how they portray their image to the world digitally. A Zoomer's brand provides a visual short-cut to describing themselves and the culture they identify with, so others know who they are immediately and how they project themselves. They expect the same hyper-customizable snapshot within a learning environment. Gen Z learns by having information on demand, taken through multiple snack-sized bites. Their culture knows how to find, interpret, and customize searches to get what data they need, and when they need it, rather than having to memorize large, excessive amounts of information dumped on them that they are expected to memorize. Gen Z digital natives desire at least five input streams when researching a topic to correlate and contrast subject matter to resolve conflict as they are formulating thought. Data shows it takes eight seconds to retain their attention. The content's title attracts the viewer, so expectations demand the bottom-line up front in eight seconds, or they are moving on. This does not mean they are flighty and can't focus their attention, it means content must make an impact in that 8 second window to grab their interest compared with the other four screens of content vying for their attention in the phigital space.⁴⁶ Furthermore, tailoring how to ingest data and pick out the details they feel they need to learn is preferable to learning at someone else's pace in a group setting. The group learning experience does not appeal to their sense of being able to customize data streams. Being able to watch a video empowers Gen Z to play, stop or rewind as appropriate.⁴⁷ But a student's ability to have content

on demand is only half of the learning process, one must also be able to have time to digest the information. *Marketing Education Review* states, “breaking concepts into 10-minute ‘chunks’ will help students retain material, but only if they have time to process the information interactively and have a chance to reflect on it.”⁴⁸ Gen Z characteristics are important to consider when trying to determine the best methods for generational language learning.

VII. Generational Learning Models

The classroom environment must adapt to meet the needs and expectations of Gen Z learners. Changing to information age methods may seem like common sense, but the first step is to think digitally. This means that given the characteristics of a digital native, they desire assessments, assignments and activities to be interactive, visual, short segments customizable for an individual.⁴⁹ There are many methods to providing an interactive environment. Thinking digitally means how content is provided and the way the teacher presents lessons is also digitally focused. Digital savvy teachers know students are wired and connected. If a phigital world is the environment students live in, the lessons should be too. Content should be created for interactive quizzes, online collaborative projects and video clips, and pre-recorded lectures with visual graphic overlays to bring the talking head to life. For example, each assignment should have the ability to be downloaded and playable on a computer, tablet, smartphone or other portable media devices regardless of make, manufacturer, or operating system. DLI already provides each student with their own media device, so adapting software for a known piece of hardware makes the process easier. Creating a phigital environment is important, but it is the teachers who must understand how to implement lessons within this new paradigm.

Teaching

Teaching Gen Z requires the understanding from both the teachers and the students to overcome hurdles in implementing new methodologies. A Pearson study show that, “Generation Z and Millennials both ranked teachers and professors as the top influencers for their personal development (78% and 80% respectively), higher than parents and their peers.”⁵⁰ As such, there are expectations from a digital learner; however, some teachers face challenges in a digital environment. Just because a millennial is from the digital age, does not mean they know everything about teaching in the digital world. There may be instances where the teacher determines that a digital solution is not appropriate for the subject matter. This is acceptable; however, Gen Z characteristics should be considered to keep a student’s attention. There may be other reasons for a teacher’s lack of ability to engage in a digital world. Some teachers do not possess the will to shift to a digital environment and leave the comfort zone existing in the industrial model. Some may be embarrassed or confused by technology. Not all students have access to technology; therefore, teachers may be reluctant to teach in a fully digital environment to fear of excluding students. There may be safety risks and cybersecurity challenges with online content the teacher is trying to protect the students from. Teachers also do not want their students to wander from the teaching material by emailing or exploring other content. Some students find opposing data to the teacher’s lessons and raise questions concerning other viewpoints the teacher is not able or prepared to discuss, thereby disrupting the lesson. The teacher may fear a lack of credibility in this instance or by the perception of being technically challenged. These challenges can be overcome with setting ground rules, providing teachers training, and ensuring the IT department is responsive to technical or connectivity issues.⁵¹

Regardless of the issues, teachers must be prepared to address these challenges as the digital transition occurs.

Transitioning to digital age practices requires strict guidelines and boundaries to keep students on track. Teachers “assignments that require students to access information online should be very clear as to goals, sources, time-spent, ways to glean and evaluate the content.”⁵² Students tend to consume data from multiple screens which can lead to a loss of focus. If teachers can segment assignments and establish time limits or rules that help students monitor their online searching and viewing, this will also aid the student to avoid losing both time and focus due to bingeing or other distractions. Once ground rules are established some online methods can be explored.

Best Practice - Online Discussions

The social aspect prevalent in Gen Z lives can enhance learning through online discussion boards in class or online during structured classroom hours. In a language environment, a student could create an electronic portfolio showing pictures of daily vocabulary and recording their pronunciation of the word. The student can also provide a sentence that describes the picture. Other students can then respond with their own descriptions and enter a dialogue over the given topic. As Gen Z also likes competition, they can then rate the postings based on complexity, humor or other criteria as the situation dictates. This methodology falls in line with social media norms of providing students a forum to test out ideas and theories.⁵³ Technology may present a challenge in trying to view the material and other students simultaneously. If presented in a classroom, the face-to-face interaction may lead to more spontaneous discussion.

Classroom Discussions

Students want lessons delivered in chunks but also desire hands-on interaction through classroom discussions. “Gen Z students flourish in any learning environment where they can flex their aptitude for self-reliance and their ability to self-educate,” according to a Barnes and Noble College study.⁵⁴ Delivering lessons prior to class can help students by allowing them to think about and explore external data sources to prepare them for the next day’s lesson or classroom discussion. Hands-on learning, coupled with an interactive discussion, is the most preferred method by 58% of Gen Z respondents. Another 38% of students would rather read source materials, then discuss, compared to the remaining 12% who desire listening to a classroom lecture.⁵⁵ In the information age classroom, the teacher facilitates an interactive classroom discussion by providing students a language problem to work through. In a Gen Z language environment, instead of vocabulary being memorized by rote, vocabulary is presented in context through visual reinforcement. The students then discuss the material, while each individual works through the process by discovery on an interactive device. As students learn, the teacher ensures the goals of the day’s lesson are met.

Kinesthetic Experiences

The Gen Z learner increases their learning when movement and hands-on involvement through personal connections is maximized. A teacher should deliver data in a 10-minute snack-sized chunk of instruction. Students would get to try the lesson immediately by role-playing, simulation, and performing tasks to reinforce the language application. Studies show this methodology builds student excitement and confidence.⁵⁶ This type of learning is perfect for

developing language skills as target language video appeals to aural and visual learners.⁵⁷ It can also be combined with learning cultural aspects of the country, given scenarios in combination with social engagement and multimedia examples. Once content is presented, the teacher must control the guided discussion and conduct hands-on activities.

Foreign Language Best Practices and the Digital Environment

Traditional models for learning a foreign language are proven to work; however, based on the new digital world, there are new advances in adapting linguistic teaching methodologies. When teaching a foreign language, teachers customarily used a grammatical approach, where the teacher presents vocabulary in drills, enforces adherence to grammatical rules and syntax, followed by learners expressing their learning in a sentence. This method, while traditionally effective, presents material as rules based (industrial age). Progress is demonstrated as the language is learned through reading texts and listening to dialogue or instruction and practicing dialogue in basic language segments. Zoomer generational characteristics lean more toward the communicative approach, where rules are expressed for sentence formation, which allows the student to express ideas to another student in the context of asking advice, making suggestions or requests, and describing one's needs. This conversational, contextual approach has proven to be more meaningful and memorable for the learner, thereby improving accuracy and fluency.⁵⁸

When considering communicative interactions combined with how the Gen Z mind ingests visual data, another area that would keep a student's interest, while offering the opportunity to experience both individual and collaborative environments extends into the computer realm. Intelligent Computer-Assisted Language Learning (ICALL)⁵⁹ utilizes a process where the both the computer and student learn from each other. The student receives intelligent

feedback from the computer as it learns where the gaps lie in a student’s knowledge on vocabulary and syntax. This feedback provides a student-customized experience which focuses on target areas requiring improvement, shortening the language learning process as the student’s proficiency grows. This time-savings can shorten the language learning process and get individuals more proficient faster. Two-dimensional (2D) software learning programs like *Rosetta Stone* use this type of technology, but this environment can be extended further using three-dimensional (3D) electronic game worlds as well as immersive virtual reality technology experiences. With Gen Z, 3D technology is quickly becoming the norm. While not all Gen Z are gamers, most understand the concept of massively multiplayer online role-playing game (MMORPG) environments, like Blizzard’s *World of Warcraft*. Since 2008, more than 500 universities and colleges in the world have made the decision to use an MMORPG called *Second Life* to provide virtual electronic learning (E-Learning) experiences.⁶⁰



Figure 7. Second Life Avatar

Source: Second Life, “Educate in the Virtual World,” Second Life Advertisement, Accessed January 7, 2020, <http://go.secondlife.com/landing/education/?lang=en>.

This atmosphere allows students to create their hyper-customized avatar, or representation of themselves, to reflect their personal brand or virtual image and interact, not just in a classroom but in virtual worlds, like taking a class trip to China to create social interaction events through typical conversation in each setting's foreign language. While there is not a *Second Life* virtual world for Chinese, there are learning opportunities for Russian and Arabic, also considered Level IV languages by DLI. This shows *Second Life* supports more complex Level IV languages and opens the possibilities of creating a Chinese language learning environment.

An observation gained through having one millennial child and one Zoomer child, is that both children considered three hours in a gaming experience akin to an eye-blink; when told to turn off their games, they both complained that they were just warming up. Computer games kept their interest due by exploring new environments or levels, where unexpected challenges popped-up in the blink of the eye. They both strived to reach a new level in the game and felt satisfaction and a sense of accomplishment once that level was attained. While hours spent in a single game seems contradictory to the snack-sized media argument, a virtual environment packed with fast-paced, complex problem-solving content is not stagnant. This ever-changing environment's forward progression provides the same perception as snack-sized media.

Foreign language experiences can be built along the same level-learning premise video games present to provide challenges for progression. As a student progresses, they can earn rewards, or stature, when a new level is reached, potentially allowing a student to upgrade their avatar so they can present their image as more advanced rather than as a novice student. Upgrading an avatar is akin to the status afforded to earning a ribbon or medal. This type of 3D-learning can be performed in class or in any location, if the location is connected to the internet.

Learning through gaming is not a new concept for the Marine Corps, it existed in the 1990's when then-CMC General Charles Krulak authorized Marines to download *Doom* and a specially designed downloadable content (DLC) to take a Marine rifle squad through a series of challenges in a virtual environment. The Corps is now using virtual reality (VR) to provide sustainment training for air tactical controllers and Joint Fires Observers so the community can ensure their skills remain current and do not degrade.⁶¹ This opens the door to a new culture of an acceptance of mandatory/directed gaming during the work day.

The benefit of the VR world is due to the technology's ability to track movement as one interacts in the VR world. VR could provide kinesthetic movement and couple actions with words. The Massachusetts Institute of Technology (MIT) study concerning kinesthetic language learning supports the premise that language concepts and vocabulary are learned faster when combined with movement and actions, like waving or bowing.⁶² A user could grab an item like a cup and perform an action like drinking, thereby connecting multiple words within the context of application. Observers can also participate by directing a student in the VR program to perform actions, creating a collaborative learning experience that is unscripted by fosters the progression of language learning.

Language learning and cultural interaction can be experienced with Augmented Reality (AR). AR takes the real world and interposes virtual imagery to enhance what the viewer is seeing or experiencing. One example is MondlyAR, which is a language learning mobile tool that utilizes artificial intelligence to assess pronunciation and provide immediate feedback as the person experiences a location or situation.⁶³



Figure 8. Mondly Augmented Reality

Source: Mondly, “MondlyAR Languages: Your own virtual language learning assistant. Anytime. Anywhere,” accessed January 25, 2020, <https://www.mondly.com/ar>.

This tool provides the student with learning content they can access anytime and place. The conversational partner displays facial expressions and gestures to replicate the non-verbal communication cues expected during the learning process. DLI students could be presented course material, or student-tailored tutoring through content on a device most familiar to a Gen Z learner.

For Chinese learning, there is also an interactive language experience called the Pimsleur approach that provides short lessons, challenges, games, skill rewards, culture, streaming and offline content all in line with Gen Z learning preferences.⁶⁴ The below image quickly shows an approach seemingly made for Zoomers.

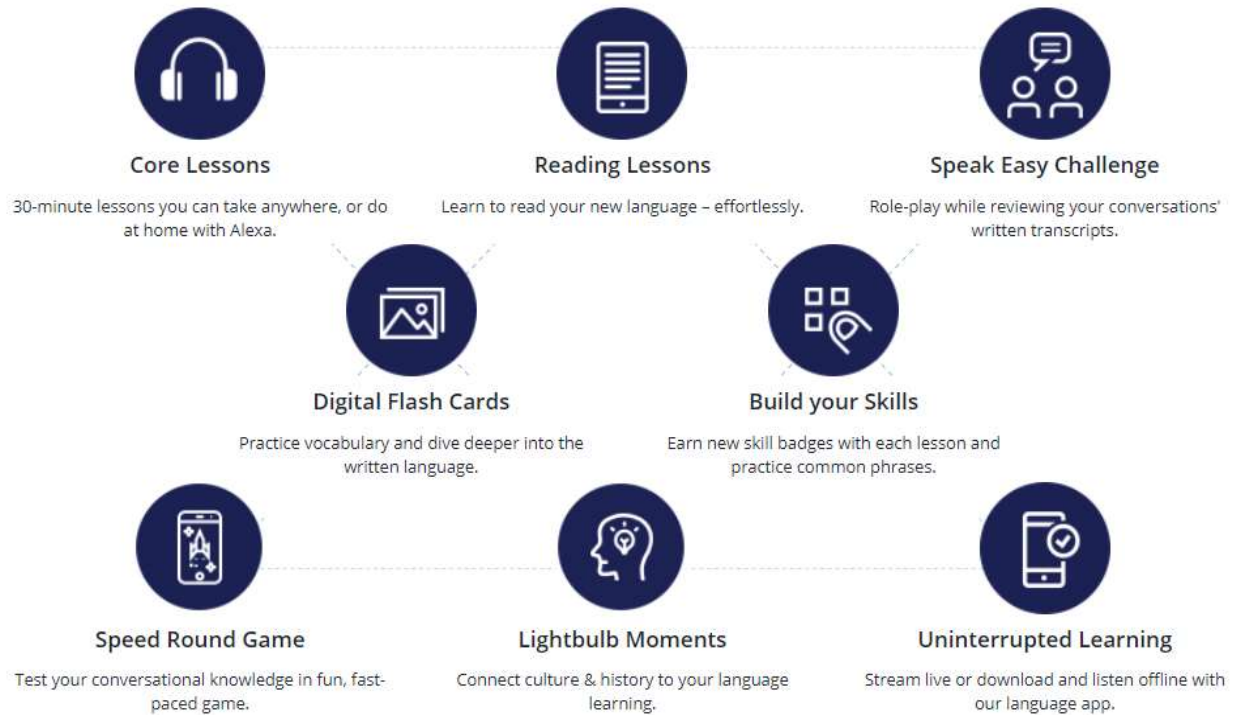


Figure 9. Pimsleur Approach to Language Learning

Source: Pimsleur, “Pimsleur.com,” accessed January 25, 2020, <https://www.pimsleur.com/#>

Language learning is progressing as our technology advances. The Pimsleur method shows how the learning space is being adapted to encourage participation of digital natives. But it is not only the technology, methods, and tools that drive change the military’s culture must also adapt.

VIII. Military Culture and DLI

The CMC’s desire to change formal schools to an information age model also impacts leaders who desire to make the change. The vision within the CPG in changing the paradigm also expresses the desire to change the Corps’ culture to embrace the digital age mindset which can be difficult in a joint environment. It is already proven that the digital age thinkers can subsume more data, have a thirst for knowledge, thrive in an inter-connected society and do not

suffer fools gladly. But there is more to be gained by adapting the information age culture that will drive innovation and creativity if the leaders foster and encourage digital age changes. While teachers can be reluctant to embrace changing age-proven techniques and shift to newer learning models, leaders also venture into the same unknowns by trying to embrace unfamiliar digital age concepts. Thinking differently requires courage, both from leaders who can reward out-of-the-box thinking and from those willing to take an intellectual risk by attempting creative approaches, especially in a fiscally constrained environment.⁶⁵ Leaders must ensure the transformation is not just verbal but put into practice. Making changes in a joint environment can be difficult, especially with only one military service desiring change.

The Marine Corps is not the only service questioning schoolhouse learning, the Air Force is vested in updating their schoolhouses. The Air Force instituted an initiative called the *Pilot Next Program* to study and change entry level pilot training. They wondered, “if it was really necessary to spend a year in training, or if advances in learning science and technology could change the structure to be more efficient.”⁶⁶ This initiative resulted in the service making changes, which cut the initial training pipeline for pilots in half while still producing the same level of pilot proficiency. Their next initiative, conducted in Oct 2019, focused on linguist training by assembling a mix of 50 government stakeholders, academia, and industry professionals to study two ideas. First, “what does an updated and modern learning environment look like and what can we do to improve our students’ outcomes and subsequent mission effectiveness?” and second, “how a restructured program, based on the most up-to-date understanding of second language acquisition and learning science, paired with advances in technologies such as Artificial Intelligence and Virtual Reality, would look and perform.”⁶⁷ This initiative resulted in a partnership with the schoolhouse to try and implement changes and an

new learning model over a two-year pilot program. They are not the only military service driving change at DLI.

Another instance of leadership influence is evident within the culture at DLI. The Marine Corps has instituted practices that have shown growth over the past four years resulting in improved graduation rates.⁶⁸ This process begins when the Marine sets foot on deck. The Marine is immersed in the *Marines Awaiting Training* program, while they wait one to two months for their official language class to start. During this waiting period, the Marine enters tutoring sessions in their assigned language during the first week. They also attend leadership and ethics-based discussions, a Lance Corporal seminar, *Prime for Life*, and a substance abuse program to prepare them for class by building skills and demonstrating desired behaviors a Marine is expected to emulate to be successful. Academics are supplemented by physical training and Marine Corps Martial Arts Program sessions to teach cohesion and continue the process of learning their new profession of arms expected of a Marine. The leadership, ethics and tutoring sessions are taught peer-to-peer, which is another Gen Z preferred approach. One could argue that Marine Corps successes are due to the military service having the smallest number of students at school, but the way this program is structured speaks to information age learning. The program aligns with Gen Z characteristics by setting expectations, holding Marines accountable, encouraging feedback through peer reviews, and conducting self-study language tutoring given in small chunks.

In addition to learning a foreign language, DLI students are also expected to understand their assigned country's culture and are provided immersive kinesthetic experiences to enhance learning. DLI teachers are native speakers who not only teach the language in class, but also teach Asian culture through music, dress, dance, food, religion, history, literature, and the arts.

This learning is supplemented by carrying out one-two overnight immersion “real-life situation scenarios which range from negotiations at a border crossing, haggling at an open market for goods, to making hotel reservations over the telephone,” while “faculty and staff dress in traditional garb, prepare and cook Asian cuisine, and, most importantly, only speak in the target language.”⁶⁹ Near the end of the course, a select few students will attend a one-month immersive experience in China or Taiwan.⁷⁰ This immersive teaching method is exactly what a Gen Z student expects, but can be enhanced through Augmented Reality tailored to a student’s deficiencies.

Recommendations/Findings

Based on the discussions regarding the pressure and expectations of becoming a linguist, 12 hour school days (including homework) coupled with military expectations (field day barracks cleaning/early pre-school physical training sessions with minimal down time to recover) creates a high stress environment. Stress can impact individuals in different ways, especially regarding memory. Neuroscience research shows that acute stress, defined as the “physiological reaction to a challenging situation involving the activation of the sympathetic nervous system and the release of the hormone cortisol, adrenaline and noradrenaline,”⁷¹ may enhance encoding in the early stages of memory formation, but impair retrieval of the encoded information. This means acute stress experienced while encoding benefits students’ study for exams, while conversely, acute stress experienced during retrieval hurts student performance especially during exams and presentations.⁷² Stress can also impact the brain architecture, which is the foundation for learning. The Harvard Center on the Developing Child says when the brain responses “remain activated at high levels for significant periods of time, without supportive relationships

to help calm them, toxic stress results. This can impair the development of neural connections, especially in the areas of the brain dedicated to higher-order skills.”⁷³ The military school environment is not recognized for nurturing supportive relationships as part of its culture. It is recommended, when incorporating enhanced digital learning methodologies, that the schoolhouse balance curriculum with military requirements and service-unique learning expectations to further minimize the impacts of stress. An attempt should be made to work service unique time, whether it is field day, physical training or service-specific knowledge into the school curriculum as part of the school day. These additive stressors should not be scheduled before or after school hours due to the heavy workload students already experience.

The second critical finding relates to time spent in class coupled with homework. Based on the data and learning preferences to maximize performance and get the most return on the investment, the current model is not optimal for the Gen Z learner. The author recommends small snack-sized interactive lessons broken up between class time and virtual time during a school day. This does not mean the student gets to leave the classroom for self-paced study, it means the student will have controlled and timed exercise to complete a lesson, given varied content delivery methods. While homework should focus on a flipped classroom style that exposes a student to the next day’s topic so the student can explore and prepare for the next day’s learning. “65% of Gen Z is on their smartphones after midnight a few times a week or more often and 29% is on their smartphones after midnight every night.”⁷⁴ It is recommended to shorten the classroom day and allow individual and group work to reinforce more learning at night. However, homework must be balanced carefully in the school day. The law of diminishing returns, where students fail to learn after a given time period, says students produce the most optimal returns with 60 to 120 minutes of homework daily.⁷⁵ The national average for

homework experienced by a military-aged Gen Z learner is 60 minutes.⁷⁶ Emotions run higher in younger adults as the rational or logical part of a teen's brain isn't fully developed until age 25 or so.⁷⁷ Therefore, doubling homework from the national average may impact preconceived notions of acceptable learning and result in an emotional reaction that will increase stress, especially when competing with military obligations, and should also be taken into account when restructuring the curriculum.

Another critical finding is the lack of (and need for) immersive collaborative experiences. If DLI could create an immersive virtual world utilizing available language technology for entry level training, these tools would be available for refresher and sustainment training after initial training ends. Linguists who notice their language skills eroding could also use it as a reference or to enhance areas individuals may feel lacking. It may also cut down on the long-term expense in sustaining manpower at the schoolhouse or free up instructor time in course development and adding to language learning for sustainment training or advanced training and culture awareness.

Finally, one recommendation is to create a Moodle-like online forum for each language that linguists can access fleet-wide. Students can feel like part of the community, and can provide connectivity with real-world experiences taking place in the Marine Corps. This can serve as a platform for tutoring students as well as provide an outlet for sustainment training to maintain proficiency levels for Marines stationed around the world. If the CMC instituted a mandatory weekly interface in the linguist forum, requiring no less than three hours a week, units could work these hours into their training plan. Linguists could spend time tutoring and connecting with other Marines to share lessons learned and create a near real-time world-wide interface.

X. Limitations

Another critical area to adapting generational learning techniques and models are service requirements to implement change; however, given time constraints the author was not able to delve into this subject. During research for this paper, the DLIFLC 2017 self-evaluation calls out a “directive from the National Security Agency (NSA) to raise military linguist language proficiency levels.”⁷⁸ However, increased proficiency levels are not reflected in the 2019 *Marine Corps MOS Manual* linguist requirements. Therefore, 2017 NSA proficiency increases do not appear to align with 2019 Marine Corps requirements for linguists. Investigating the impact of training military linguists to the military standard and not the NSA standard requires further exploration. One may question if using the military standard in the initial training pipeline would save time, money, and provide the services with more analysts sooner. The author recommends exploring the possibility of establishing an NSA-specific follow-on course, or intermediate level course to target linguists with a higher aptitude for assignment in the NSA environment.

XI. Conclusion

Instituting change in an organization is challenging, especially when trying to institute a new paradigm across a wide cultural divide. The military comprises diverse individuals from a broad range of cultural backgrounds. When Marines experience friction related to generational differences, the challenges associated with organizational change become even more complex. However, the CMC called all leaders and subordinate Marines alike to action to institute a cultural change and embrace the information age. This requires courage and dedication to foster growth, to look for opportunities to institute dynamic new practices and to commit to making a

change. Marines are on the cutting edge of determining what their new culture will look like and how it will take shape. The Commandant is giving carte blanche to push this change to create environments where information age creativity and innovation becomes the new norm.

Generation Z has opened the doors to new prospects. Viewing the world through the eyes of Gen Z, one sees the prospect of hope, fluid possibilities, and humankind accepting of the right to be oneself. Gen Z not only expects change and customization but demands it. Their information age mindset lives the art of the possible and connects their community through brands and influencers to implement change. Social consciousness is part of the Zoomer DNA.

Implementing informational age learning models in formal schools, like DLI, must occur but will require time and dedication to change the Corps' school culture. Schoolhouse leadership must balance military service profession of arms training with the formal school process, to implement a culture attuned to an information age mindset. The Corps must adapt and overcome its industrial bias and join the 21st century. The Commandant identified the expanding role on the digital battlefield. Digital warriors are here, ready to engage.

Notes:

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- ¹ Training Command. *Systems Approach to Training Manual*. (Quantico, VA: Training and Education Command, US Marine Corps, 2004), 1, https://www.trngcmd.marines.mil/Portals/207/Docs/FLW/EEIC/SAT_Manual.pdf.
- ² Headquarters Marine Corps. *Commandant's Planning Guidance*. (Washington, DC: Headquarters US Marine Corps, 2019), 1. <https://www.marines.mil/News/Publications/MCPEL/Electronic-Library-Display/Article/1907265/38th-commandants-planning-guidance/>.
- ³ US Department of Defense. *Summary of the 2018 National Defense Strategy of the United States of America*. (Washington, DC, 2018), <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.
- ⁴ The White House. *National Security Strategy of the United States of America*. (Washington, DC: White House, December 2017), 28, <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>.
- ⁵ Headquarters Marine Corps. *Commandant's Planning Guidance*. (Washington, DC: Headquarters US Marine Corps, 2019), 13.
- ⁶ John Durish, "Marine Corps Foreign Language Capabilities: Strategies to Mitigate Capability Gaps and Improve Mission Success," (master's thesis, Marine Corps University, 2018), 5-10, https://usmc.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma991003573829805241&context=L&vid=01USMCU_INST:USMC&lang=en&adaptor=Local%20Search%20Engine&query=any,contains,durish.
- ⁷ David E. Rosenbrock, "The Impact of Generation Z on Marine Corps Recruiting," (master's thesis, Marine Corps University, 2018), 3., https://usmc.primo.exlibrisgroup.com/view/delivery/01USMCU_INST/1246426970005241.
- ⁸ Mccrindle Research, "Generations Defined," last modified 2018, but truncated by writer from <https://mccrindle.com.au/wp-content/uploads/2018/03/Generations-Defined-Sociologically.pdf>.
- ⁹ John Durish, "Marine Corps Foreign Language Capabilities: Strategies to Mitigate Capability Gaps and Improve Mission Success," (master's thesis, Marine Corps University, 2018).
- ¹⁰ Defense Language Institute Foreign Language Center, *Institution Self Evaluation Report 2017*, (Monterey, CA: DLIFLC, 2017) https://www.dliflc.edu/wp-content/uploads/2018/01/DLIFLC-Self-Study-December-2017_small.pdf.
- ¹¹ Defense Language Institute Foreign Language Center, *Institution Self Evaluation Report 201*, (Monterey, CA: DLIFLC, 2017), 124.
- ¹² Defense Language Institute Foreign Language Center, *Institution Self Evaluation Report 201*, (Monterey, CA: DLIFLC, 2017), 213-215.
- ¹³ Monarch Media, Inc, "Monarch Media, Inc., Business White Paper: Open-Source Learning Management Systems: Sakai and Moodle," *Monarch Media.com*, 2010, 10, <https://www.monarchmedia.com/wp-content/uploads/2015/01/open-source-lms-sakai-and-moodle.pdf>.
- ¹⁴ ESWcompany.com, "History of SharePoint: Then and Now The Dark Ages," ESWcompany.com, accessed March 28, 2020, <https://www.eswcompany.com/history-sharepoint-future/>.
- ¹⁵ Sutori.com, "History of Education/Schooling (102)," Sutori.com, accessed March 28, 2020, <https://www.sutori.com/item/the-invention-of-the-smart-board-1991-the-smartboard-was-invented-by-david-ma>
- ¹⁶ Defense Language Institute Foreign Language Center, *Institution Self Evaluation Report 201*, (Monterey, CA: DLIFLC, 2017), 56, 71, 127, 141, 183.
- ¹⁷ Defense Language Institute Foreign Language Center, *Institution Self Evaluation Report 201*, (Monterey, CA: DLIFLC, 2017), 73, 87.
- ¹⁸ Katie Lange, "64 Weeks to Fluency: How Military Linguists Learn Their Craft," news release, *Defense Media Activity*, April 27, 2018, <https://www.dodlive.mil/2018/04/27/64-weeks-to-fluency-how-military-linguists-learn-their-craft/>.
- ¹⁹ Katie Lange, "64 Weeks to Fluency: How Military Linguists Learn Their Craft," news release, *Defense Media Activity*, April 27, 2018.
- ²⁰ Defense Language Institute Foreign Language Center, *Institution Self Evaluation Report 2017*, (Monterey, CA: DLIFLC, 2017) https://www.dliflc.edu/wp-content/uploads/2018/01/DLIFLC-Self-Study-December-2017_small.pdf.
- ²¹ Headquarters Marine Corps. *Importance of Foreign Language Capabilities*, All Marine Message 072/03, December 10, 2003, <https://www.marines.mil/News/Messages/Messages-Display/Article/887118/importance-of-foreign-language-capabilities/>.

-
- ²² Jennifer J. Li and Lindsay Daugherty, *Training Cyber Warriors: What Can Be Learned from Defense Language Training?*, (Santa Monica, CA: RAND Corporation, 2015), https://www.rand.org/pubs/research_reports/RR476.html.
- ²³ Commandant of the Marine Corps, *FY 2020 Marine Corps Foreign Language Proficiency Bonus Eligibility Requirements*, MARADMIN 415/19, July 26, 2019, <https://www.marines.mil/News/Messages/Messages-Display/Article/1917768/fy-2020-marine-corps-foreign-language-proficiency-bonus-eligibility-requirements/>.
- ²⁴ Commandant of the Marine Corps, *Military Occupational Specialties Manual*, NAVMC 1200.1E, March 29, 2019, 3-137, 3-165 https://www.trngcmd.marines.mil/Portals/207/Docs/wtbn/MCCMOS/FY20%20MOS%20Manual%20NAVMC_1200_1E_Signed.pdf?ver=2019-04-17-130202-033.
- ²⁵ US Government Accountability Office, *Department of State: Foreign Language Proficiency Has Improved, but Efforts to Reduce Gaps Need Evaluation*, (Washington, DC: Government Accountability Office, 2017), 23, <https://www.gao.gov/products/GAO-17-318>.
- ²⁶ Defense Language Institute Foreign Language Center, “Languages Taught At DLIFLC and Duration of Courses,” DLIFLC, accessed January 4, 2020, <https://www.dliflc.edu/about/languages-at-dliflc/>.
- ²⁷ Defense Language Institute, “General Catalog 2017-2018,” DLI, accessed January 4, 2020, https://www.dliflc.edu/wp-content/uploads/2016/12/GeneralCatalog_Online-Color_FY17-18.pdf.
- ²⁸ Department of Defense, *2018 Demographics: Profile of the Military Community* (Washington, DC: Department of Defense, 2018), 15, 39, <https://download.militaryonesource.mil/12038/MOS/Reports/2018-demographics-report.pdf>.
- ²⁹ Training and Education Command, *Concepts and Programs 2019: Supporting Establishment* (Camp Pendleton, CA: US Marine Corps, 2019, November 2), 1, <https://www.candp.marines.mil/Organization/Supporting-Establishment/Training-and-Education-Command-TECOM/#:~:targetText=Training%20Command%20accomplishes%20its%20mission,Marines%20and%20sailors%20under%20command>.
- ³⁰ David E. Rosenbrock, “The Impact of Generation Z on Marine Corps Recruiting,” (master’s thesis, Marine Corps University, 2018), 4, https://usmc.primo.exlibrisgroup.com/view/delivery/01USMCU_INST/1246426970005241.
- ³¹ Mccrindle Research, “Generations Defined,” last modified 2018.
- ³² Clarus, December 6, 2019, comment on Dr Eric Jensen “Benefits of Flexible Classroom Design,” <https://www.clarus.com/benefits-of-flexible-classroom-design/>.
- ³³ Grace Chen, “Kinesthetic Children and The Right Education,” *Public School Review*, Types of Learning (blog), June 25, 2019, <https://www.publicschoolreview.com/blog/kinesthetic-children-and-the-right-education>.
- ³⁴ Bernie Trilling and Paul Hood, “Learning, Technology, and Education Reform in the Knowledge Age or We’re Wired, Webbed, And Windowed, Now What?,” *Educational Technology*, (May-June 1999), 11, http://www.indiana.edu/~syschang/decatour/documents/07_trilling.pdf.
- ³⁵ David Stillman and Jonah Stillman, *Gen Z at Work*, (New York: HarperCollins Publishers, 2017), 78-84.
- ³⁶ Martin Henley, “Is Your IT Department Ready for Generation Z?,” *InformationWeek.com* (blog), January 8, 2020, <https://www.informationweek.com/strategic-cio/team-building-and-staffing/is-your-it-department-ready-for-generation-z/a/d-id/1336663>.
- ³⁷ Julie Houpt and Bill Faust, *Strategies and Tactics for Connecting with Young Alumni: Engaging and Cultivating Millennials and Gen Z*, Ologie, Denison University, PowerPoint Presentation, December 16, 2014, 34, <https://www.slideshare.net/Ologie/engaging-and-cultivating-millennials-gen-z>.
- ³⁸ Julie Houpt and Bill Faust, *Strategies and Tactics for Connecting with Young Alumni: Engaging and Cultivating Millennials and Gen Z*, 36.
- ³⁹ Jared Boucher, “Top 10 Gen Z Statistics From 2018”, *The Center for Generational Kinetics* accessed on January 19, 2020, <https://genhq.com/top-10-ways-gen-z-is-shaping-the-future/>.
- ⁴⁰ Julie Houpt and Bill Faust, *Strategies and Tactics for Connecting with Young Alumni: Engaging and Cultivating Millennials and Gen Z*, 37.
- ⁴¹ David Stillman and Jonah Stillman, *Gen Z at Work*, (New York: HarperCollins Publishers, 2017), 108.
- ⁴² Boucher, “Top 10 Gen Z Statistics From 2018”, 1.
- ⁴³ David Stillman and Jonah Stillman, *Gen Z at Work*, (New York: HarperCollins Publishers, 2017), 106-110.
- ⁴⁴ David Stillman and Jonah Stillman, *Gen Z at Work*, (New York: HarperCollins Publishers, 2017), 111.
- ⁴⁵ Morning Consult, “The Influencer Report: Engaging Gen Z and Millennials,” *Morning Consult*, (2019), 10, <https://morningconsult.com/wp-content/uploads/2019/11/The-Influencer-Report-Engaging-Gen-Z-and-Millennials.pdf>.
- ⁴⁶ Vickie S Cook, “Generation Z Engaged in the Classroom,” *WCET Frontiers* (blog). January 19, 2020, <https://wcetfrontiers.org/2019/03/06/generation-z-engaged-in-the-classroom/>.

-
- ⁴⁷ David Stillman and Jonah Stillman, *Gen Z at Work*, (New York: HarperCollins Publishers, 2017), 124,125.
- ⁴⁸ Erika Matulich and Raymond Papp and Diana Haytko, "Continuous Improvement through Teaching Innovations: a Requirement for Today's Learners," *Marketing Education Review*, 18 (2008), 2, https://www.researchgate.net/publication/290861058_Continuous_Improvement_through_Teaching_Innovations_a_Requirement_for_Today's_Learners.
- ⁴⁹ Vickie S. Cook, 2019 LCCC: "Connecting with Generation Z Students," University of Illinois Springfield, accessed January 19, 2020, https://go.uis.edu/2019LCCC_GenZ.
- ⁵⁰ Pearson, "New Research Finds YouTube, Video Drives Generation Z Learning Preference," *Pearson*, (blog), August 8, 2018, <https://www.pearson.com/news-and-research/announcements/2018/08/new-research-finds-youtube-video-drives-generation-z-learning-p.html>.
- ⁵¹ Brendon Hyndman, "Ten reasons teachers can struggle to use technology in the classroom," *Phys.org* (blog), August 14, 2018, <https://phys.org/news/2018-08-ten-teachers-struggle-technology-classroom.html>.
- ⁵² Kathleen A. J. Mohr and Eric S. Mohr. "Understanding Generation Z Students to Promote a Contemporary Learning Environment," *Journal on Empowering Teaching Excellence*, Vol 1 (2017), 89, <https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1005&context=jete>.
- ⁵³ G. S Shivakumar and T. Manichander, "Restructuring the Future Classroom--A Global Perspective," *Journal on School Educational Technology*, v9 n2 (2013), 20, <https://eric.ed.gov/?id=EJ1098303>.
Journal on School Educational Technology, v9 n2 p19-24 Sep-Nov 2013.
- ⁵⁴ Barnes and Nobles College, *Getting to Know Gen Z: Exploring Middle and High Schoolers' Expectations for Higher Education*, (Barnes and Nobles College, 2015), 6, <https://next.bncollege.com/wp-content/uploads/2015/10/Gen-Z-Research-Report-Final.pdf>.
- ⁵⁵ Barnes and Nobles College, *Getting to Know Gen Z: Exploring Middle and High Schoolers' Expectations for Higher Education*, 7.
- ⁵⁶ David Stillman and Jonah Stillman, *Gen Z at Work*, (New York: HarperCollins Publishers, 2017), 127.
- ⁵⁷ Christopher D. Sams, "Seven Best Practices for the Foreign Language Classroom," *People, Practices, and Programs that Inspire*, (Buffalo, NY: NYSAFLT, 2011), 38, http://accd.nysaflt.org/accd/2011/accd/media/pdf/articles/article_sams.pdf.
- ⁵⁸ Allison Kleinsasser, "Best Practices in the Foreign Language Classroom," (master's thesis, Dort College, 2014), 6-7, https://digitalcollections.dordt.edu/cgi/viewcontent.cgi?article=1048&context=med_theses.
- ⁵⁹ Ken Beatty, *Teaching and Researching Computer-Assisted Language Learning*, 2nd ed., ed. Christopher N. Candlin and David R. Hall (2003, Pearson Education Limited, 2010), 44, <https://pdfs.semanticscholar.org/6641/a0cac9baa64a589b982cc4f355b79f42b7b7.pdf>.
- ⁶⁰ Ahmed Maafoon Alenezia and Krishna Kirti Shahib, "Interactive e-learning through second life with blackboard technology," *Procedia - Social and Behavioral Sciences* 176 (2015), 892, <https://www.sciencedirect.com/science/article/pii/S187704281500592>.
- ⁶¹ Shawn Snow, "The Corps Authorized Marines to Play a Special Version of Doom in the Late 90s to Help Train for Combat," *Marine Corps Times.com*, November 6, 2019, https://www.marinecorpstimes.com/news/your-marine-corps/2019/11/06/the-corps-authorized-marines-to-play-a-special-version-of-doom-in-the-late-90s-to-help-train-for-combat/?utm_source=facebook.com&utm_medium=social&utm_campaign=Socialflow+MAR.
- ⁶² Christian David Vázquez Machado, "Kinesthetic Language Learning in Virtual Reality: Tapping into the physicality of language to enhance the way we learn," *MIT Media Lab* (June 19, 2018), 2-7, <https://www.media.mit.edu/posts/kinesthetic-language-learning-in-virtual-reality/>.
- ⁶³ Mondly, "MondlyAR Languages: Your own virtual language learning assistant. Anytime. Anywhere," accessed January 25, 2020, <https://www.mondly.com/ar>.
- ⁶⁴ Pimsleur, "Pimsleur.com," Pimsleur, accessed January 25, 2020, <https://www.pimsleur.com/#>
- ⁶⁵ Heather Venable, "What Happens in White Space Should Not Stay in White Space: Fomenting Creativity in Professional Military Education," *Strategy Bridge* (June 11, 2019), 3, <https://thestrategybridge.org/the-bridge/2019/6/11/what-happens-in-white-space-should-not-stay-in-white-space-fomenting-creativity-in-professional-military-education>.
- ⁶⁶ Tammy Cario, "Air Force Takes a Novel Approach to Cryptolinguist Training," news release, *Defense Language Institute Foreign Language Center*, October 28,2019, "<https://www.dliflc.edu/air-force-takes-a-novel-approach-to-cryptolinguist-training/>.
- ⁶⁷ Tammy Cario, "Air Force Takes a Novel Approach to Cryptolinguist Training," news release, *Defense Language Institute Foreign Language Center*, October 28,2019, "<https://www.dliflc.edu/air-force-takes-a-novel-approach-to-cryptolinguist-training/>.

-
- ⁶⁸ Tammy Cario, “Marines’ holistic approach improves graduation rate,” news release, *Defense Language Institute Foreign Language Center*, August 28, 2019, <https://www.dliflc.edu/marines-holistic-approach-improves-graduation-rate/>.
- ⁶⁹ Defense Language Institute Foreign Language Center, Language Schools: Asian Schools, (n.d.) accessed January 25, 2020, <https://www.dliflc.edu/academics/language-schools/#homepage-tab|1>.
- ⁷⁰ Katie Lange, “64 Weeks to Fluency: How Military Linguists Learn Their Craft,” news release, *Defense Media Activity*, April 27, 2018.
- ⁷¹ Lucius Caviola, “Acute Stress,” *The Inquisitive Mind*, accessed January 25, 2020, https://www.in-mind.org/glossary/letter_a#acute_stress.
- ⁷² Carey Marr, et al., “The Effect of Acute Stress on Memory: How It Helps and How It Hurts Memory,” *The Inquisitive Mind*, Issue 38, September 2018, <https://www.in-mind.org/article/the-effect-of-acute-stress-on-memory-how-it-helps-and-how-it-hurts>.
- ⁷³ Harvard University, “Brain Architecture,” Harvard University Center on the Developing Child (blog), n.d., <https://developingchild.harvard.edu/science/key-concepts/brain-architecture/>.
- ⁷⁴ Boucher, “Top 10 Gen Z Statistics From 2018”, 1.
- ⁷⁵ Rubin Fernandez-Alonso, Javier Suárez-Álvarez, and Jose Muniz, “Adolescents’ homework performance in mathematics and science: Personal factors and teaching practices,” *Journal of Educational Psychology*, vol. 107(4), (2015), 1078, <https://www.apa.org/pubs/journals/releases/edu-0000032.pdf>.
- ⁷⁶ Giselle Abramovich, “15 Mind-Blowing Stats About Generation Z,” *CMO by Adobe* (blog), 2019, <https://cmo.adobe.com/articles/2019/6/15-mind-blowing-stats-about-generation-z.html#gs.uumfhx>.
- ⁷⁷ University of Rochester Medical Center, “Understanding the Teen Brain,” *Health Encyclopedia*, accessed January 25, 2020, <https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=1&ContentID=3051>.

Bibliography

- Alenezia, Ahmed Maajoon and Krishna Kirti Shahib, "Interactive e-learning through second life with blackboard technology," *Procedia - Social and Behavioral Sciences* 176 (2015), <https://www.sciencedirect.com/science/article/pii/S187704281500592>.
- Barnes and Nobles College, *Getting to Know Gen Z: Exploring Middle and High Schoolers' Expectations for Higher Education*. Barnes and Nobles College, 2015. <https://next.bncollege.com/wp-content/uploads/2015/10/Gen-Z-Research-Report-Final.pdf>.
- Beatty, Ken. *Teaching and Researching Computer-Assisted Language Learning*, 2nd ed. Edited by Christopher N. Candlin and David R. Hall. Reprint of the 2003 Pearson Education Limited, 2010. <https://pdfs.semanticscholar.org/6641/a0cac9baa64a589b982cc4f355b79f42b7b7.pdf>.
- Commandant of the Marine Corps. *FY 2020 Marine Corps Foreign Language Proficiency Bonus Eligibility Requirements*. MARADMIN 415/19. <https://www.marines.mil/News/Messages/Messages-Display/Article/1917768/fy-2020-marine-corps-foreign-language-proficiency-bonus-eligibility-requirements/>.
- Commandant of the Marine Corps. *Military Occupational Specialties Manual*. NAVMC 1200.1E, March 29, 2019. https://www.trngcmd.marines.mil/Portals/207/Docs/wtbn/MCCMOS/FY20%20MOS%20Manual%20NAVMC_1200_1E_Signed.pdf?ver=2019-04-17-130202-033.
- Defense Language Institute Foreign Language Center, *Institution Self Evaluation Report 2017*. Monterey, CA: DLIFLC, 2017. https://www.dliflc.edu/wp-content/uploads/2018/01/DLIFLC-Self-Study-December-2017_small.pdf.
- Department of Defense. *2018 Demographics: Profile of the Military Community*. Washington, DC: Department of Defense, 2018. <https://download.militaryonesource.mil/12038/MOS/Reports/2018-demographics-report.pdf>.
- Durish, John. "Marine Corps Foreign Language Capabilities: Strategies to Mitigate Capability Gaps and Improve Mission Success." Master's thesis, Marine Corps University, 2018. Marine Corps Library, https://usmc.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma991003573829805241&context=L&vid=01USMCU_INST:USMC&lang=en&adaptor=Local%20Search%20Engine&query=any,contains,durish.
- Fernandez-Alonso, Rubin, Javier Suárez-Álvarez, and Jose Muniz. "Adolescents' homework performance in mathematics and science: Personal factors and teaching practices." *Journal of Educational Psychology*, vol. 107(4) (2015). <https://www.apa.org/pubs/journals/releases/edu-0000032.pdf>.

-
- Headquarters Marine Corps. *Commandant's Planning Guidance*. Washington, DC: Headquarters US Marine Corps, 2019. <https://www.marines.mil/News/Publications/MCPPEL/Electronic-Library-Display/Article/1907265/38th-commandants-planning-guidance/>.
- Headquarters Marine Corps. *Importance of Foreign Language Capabilities*. All Marine Message 072/03, December 10, 2003. <https://www.marines.mil/News/Messages/Messages-Display/Article/887118/importance-of-foreign-language-capabilities/>.
- Houpt, Julie and Bill Faust. *Strategies and Tactics for Connecting with Young Alumni: Engaging and Cultivating Millennials and Gen Z*. Ologie, Denison University. PowerPoint Presentation. December 16, 2014. <https://www.slideshare.net/Ologie/engaging-and-cultivating-millennials-gen-z>.
- Kleinsasser, Allison. "Best Practices in the Foreign Language Classroom." Master's thesis, Dort College, 2014. https://digitalcollections.dordt.edu/cgi/viewcontent.cgi?article=1048&context=med_theses.
- Li, Jennifer J. and Lindsay Daugherty. *Training Cyber Warriors: What Can Be Learned from Defense Language Training?* Santa Monica, CA: RAND Corporation, 2015. https://www.rand.org/pubs/research_reports/RR476.html.
- Machado, Christian David Vázquez. "Kinesthetic Language Learning in Virtual Reality: Tapping into the physicality of language to enhance the way we learn," *MIT Media Lab*, (June 19, 2018), <https://www.media.mit.edu/posts/kinesthetic-language-learning-in-virtual-reality/>.
- Marr, Carey, Melanie Sauerland, Henry Otgaar, Conny Quaedflieg and Lorraine Hope. "The Effect of Acute Stress on Memory: How It Helps and How It Hurts Memory." *The Inquisitive Mind*, Issue 38, September 2018, <https://www.in-mind.org/article/the-effect-of-acute-stress-on-memory-how-it-helps-and-how-it-hurts>.
- Matulich, Erika and Raymond Papp and Diana Haytko. "Continuous Improvement through Teaching Innovations: A Requirement for Today's Learners," *Marketing Education Review*, 18, (2008), https://www.researchgate.net/publication/290861058_Continuous_Improvement_through_Teaching_Innovations_a_Requirement_for_Today's_Learners.
- Mohr, Kathleen A. J. and Eric S. Mohr. "Understanding Generation Z Students to Promote a Contemporary Learning Environment." *Journal on Empowering Teaching Excellence*. Vol 1 (2017). <https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1005&context=jete>.
- Monarch Media, Inc. "Monarch Media, Inc., Business White Paper: Open-Source Learning Management Systems: Sakai and Moodle," *Monarch Media.com*, 2010. <https://www.monarchmedia.com/wp-content/uploads/2015/01/open-source-lms-sakai-and-moodle.pdf>.

-
- Morning Consult. "The Influencer Report: Engaging Gen Z and Millennials." *Morning Consult*, (2019), 10, <https://morningconsult.com/wp-content/uploads/2019/11/The-Influencer-Report-Engaging-Gen-Z-and-Millennials.pdf>.
- Rosenbrock, David E. "The Impact of Generation Z on Marine Corps Recruiting." Master's thesis, Marine Corps University, 2018. Marine Corps Library, https://usmc.primo.exlibrisgroup.com/view/delivery/01USMCU_INST/1246426970005241.
- Sams, Christopher D. "Seven Best Practices for the Foreign Language Classroom." *People, Practices, and Programs that Inspire*. Buffalo, NY: NYSAFLT, 2011. http://accd.nysaflt.org/accd/2011/accd/media/pdf/articles/article_sams.pdf.
- Shivakumar, G. S and T. Manichander. "Restructuring the Future Classroom--A Global Perspective." *Journal on School Educational Technology*, v9 n2 (2013), <https://eric.ed.gov/?id=EJ1098303>.
- Stillman, David and Jonah Stillman, *Gen Z at Work*. New York: HarperCollins Publishers, 2017.
- The White House. *National Security Strategy of the United States of America*. Washington, DC: White House, December 2017. <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>.
- Training and Education Command. *Concepts and Programs 2019: Supporting Establishment*. Camp Pendleton, CA: US Marine Corps, 2019, November 2, [https://www.candp.marines.mil/Organization/Supporting-Establishment/Training-and-Education-Command-TECOM/#:~:targetText=Training%20Command%](https://www.candp.marines.mil/Organization/Supporting-Establishment/Training-and-Education-Command-TECOM/#:~:targetText=Training%20Command%20).
- Training and Education Command. *Systems Approach to Training Manual*. Quantico, VA: Training and Education Command, US Marine Corps, 2004. https://www.trngcmd.marines.mil/Portals/207/Docs/FLW/EEIC/SAT_Manual.pdf.
- Trilling, Bernie and Hood, Paul. "Learning, Technology, and Education Reform in the Knowledge Age or We're Wired, Webbed, And Windowed, Now What?" *Educational Technology*, (May-June 1999), http://www.indiana.edu/~syschang/decaturn/documents/07_trilling.pdf.
- Tulanian. "Impression: David Berger." *Tulanian*, December 2019. <https://tulanian.tulane.edu/september-2019/impression-david-berger>.
- US Department of Defense. *Summary of the 2018 National Defense Strategy of the United States of America*. Washington, DC, 2018. <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

US Government Accountability Office. *Department of State: Foreign Language Proficiency Has Improved, but Efforts to Reduce Gaps Need Evaluation*. Washington, DC: Government Accountability Office, 2017. <https://www.gao.gov/products/GAO-17-318>.

Venable, Heather. "What Happens in White Space Should Not Stay in White Space: Fomenting Creativity in Professional Military Education," *Strategy Bridge* (June 11, 2019), <https://thestrategybridge.org/the-bridge/2019/6/11/what-happens-in-white-space-should-not-stay-in-white-space-fomenting-creativity-in-professional-military-education>.