Training Technology

A 21st century necessity

by Daniel S. Keenan

Ground Supply School has an academic mission focused on training Marines to perform critical skills in the Operating Forces. The challenges begin with a lack of resources, such as personnel shortages (instructional technology (IT) and mobile training suites (MTS) subject matter expert), WiFi technology, faulty training systems (reliability is less than 40 percent on many days), outdated programs within the MTSs, and SMART Board connectivity issues (for example, SMART being used as a projector and white board for PowerPoint only). These issues are further compounded by the apparent lack of kinetic interest and drive from higher headquarters to secure updated programs and resources to ensure our Marines achieve a mastery level of training. Ultimately, the training of supply Marines is in jeopardy of failing—if it has not already failed. With the mission of training supply Marines being foremost and considered most important by many generals in the Operation Forces, it is surprising that failure in "training" supply Marines is openly allowed or, in some instances, being effectively ignored. Since the onset of Global Combat Support System-Marine Corps (GCSS-MC), the enterprise supply system for the U.S. Marine Corps, and its inclusion to the supply curriculum in 2010, I have witnessed commanders and flag officers turn a blind eye to the abject state of training supply Marines; many give excuses including: why technology cannot or will not be garnered, why it is considered unworthy, how it is not possible because of security interests, why it is too expensive, why it is not a priority, or that the status quo is satisfactory enough. We all know what excuses are, but these excuses will not suffice if one of our Marines dies because a 3043 Supply Marine training was insufficient—especially when the school has "mastery" as the supposed graduation requirement.

>Dr. Keenan is a licensed career educator with over 25 years in experiential knowledge in teaching in the public sector and in school administration. He served over 40 years in the Marine Corps as an officer and Federal Service employee having earned his doctorate from Old Dominion University in Occupation and Technical Education specializing in Education Technology.

As a government entity, there are business challenges and responsibilities we must face. We have the responsibility to care for the lives of our Marines and the security of our Nation, that is an undeniable and most serious fact. However, we must also accept that our responsibility is to protect and consider dwindling resources to ensure every employee and Marine is efficient, and everything we employ is cost-effective. This means everything must work as designed. One hundred percent operability may be a stretch, but there can be no intellectual arguments stating that a means to secure their maintenance is a demanding qualifier. After all, the school is training and readiness (T&R) bound. All training outcomes must have tangible and measurable returns that outlast the confines of the learning environment. The learned tasks must extend well beyond the classroom and onto the battlefield. Students must perform T&R tasks in front of a qualified MOS proficient instructor. As trainers and educators, we must ensure this is accomplished; this is our duty; this is our sacred trust; this is our purpose for existence*: to ensure every student can perform each task as required in the T&R.*

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As a sacred votary of this responsibility, I offer a simplified process that will take our training to an acceptable level. We must first incorporate Wi-Fi and Bluetooth enabled devices into and throughout the learning establishment. Wi-Fi has existed since 1999 when Apple® incorporated it with their iBooks.[1] Flexible learning and mobility is the future of IT. A good wireless network must be installed to allow schools to institute mobile eLearning in their program of instruction and practice. This will best serve our student demographic as it supports the findings of educational research.[2]

Almost all devices used for eLearning require a wireless connection or are wireless-enabled capable. Couple this with career-level learners bringing personal electronics, such as laptops, cell phones, or iPads, to the learning venue (formal or informal) results in an exponential increase in the availability of knowledge to students.[3] Learning modalities and the cognitive power achieved through the usage of mobile electronics enables success both inside and outside of the classroom, with the former being the most important as

learned tasks are immediately applied to the working environment. This demographic of learners requires a need for shared resources and security, thus making the wireless network a number one priority. With Wi-Fi in place and all the technology it enables, formal learning centers can progress into the future.

Fleming and Mills designed the VARK model which details learning styles based on human sensory modalities.[4] VARK is an acronym for the sensory modalities: visual (V), auditory (A), read/write (R), and kinesthetic (K). Visual learners process the information best visually; auditory learners process best by hearing; read-write learners prefer to see written words; and kinesthetic learners like to garner information through experience and practice.[5] This study demonstrates that our learners require the use of all senses to be cognitively effective.

Kharb, Samanta, Jindal, and Singh conducted a cross sectional study on 100 first semester medical students enrolled at Sharda University, India.[6] Using the VARK model, they found that students may prefer a single mode of reception of information (unimodal), two modes (bimodal), three modes (trimodal) or all four modes (quadrimodal). The study revealed that 61 percent of students had multimodal learning style preferences and that only 39 percent of students had unimodal preferences. Amongst the multimodal learning styles, the most preferred mode was bimodal, followed by unimodal, trimodal and quadrimodal respectively (see Figure 1.).[7]

Additionally, learning style preferences of the female students were more varied, which included all the bimodal (VA, VK, VR, AK AR, KR) and the trimodal (VAK, VAR, AKR and VRK) learning styles, whereas in the male student population, the VR and AR bimodal combinations were not represented.[8] It was also observed that a significantly higher number of female students preferred the auditory mode of learning when compared to males who preferred the kinesthetic mode.[9] Most students learn effectively as long as teaching methods include a variety of activities that stimulate the visual,

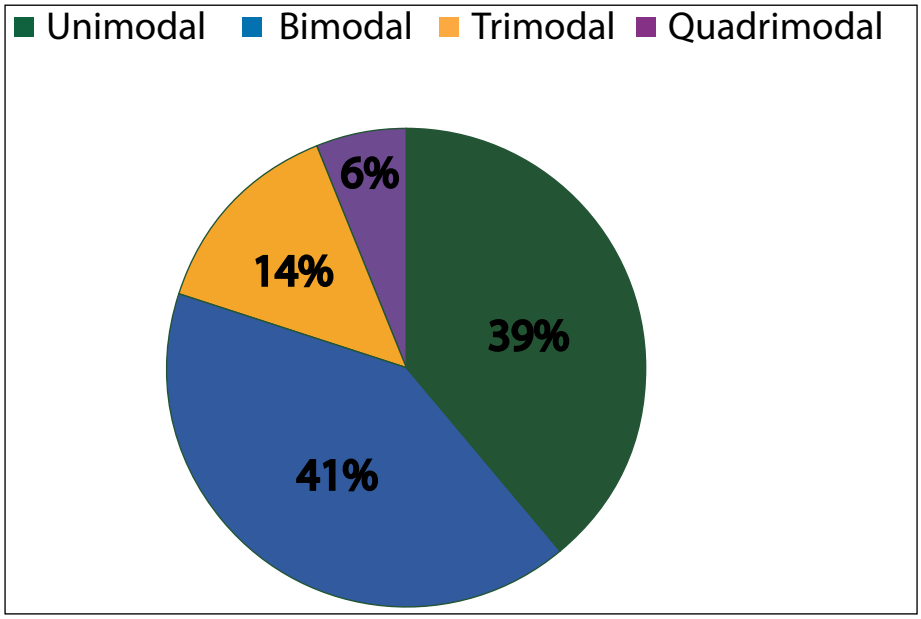

Figure 1. Modes of reception. *(Kharb, Samanta, Jindal, & Singh, 2013.)*

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aural, read-write, and the kinesthetic sensory modalities (see Figure 2.).[10]

The Kharb, Samanta, Jindal, and Singh study also confirmed what was already assumed: the preferred teaching-learning method among all the students was practicals or dissections (39 percent). It was closely followed by the supporting lectures (32 percent), self-study (18 percent) and tutorials (11 percent). Interestingly, among the female students, the second most pre-

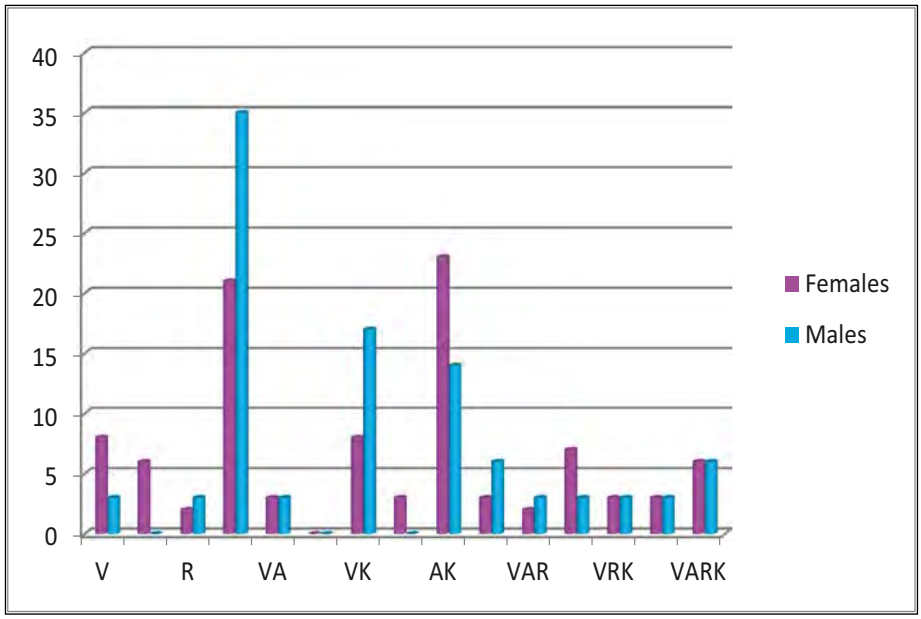

Figure 2. Distribution of various combinations of learning styles in male and female students. V- visual, A- auditory, R- read-write, K- kinesthetic. *(Kharb, Samanta, Jindal, & Singh, 2013.)*

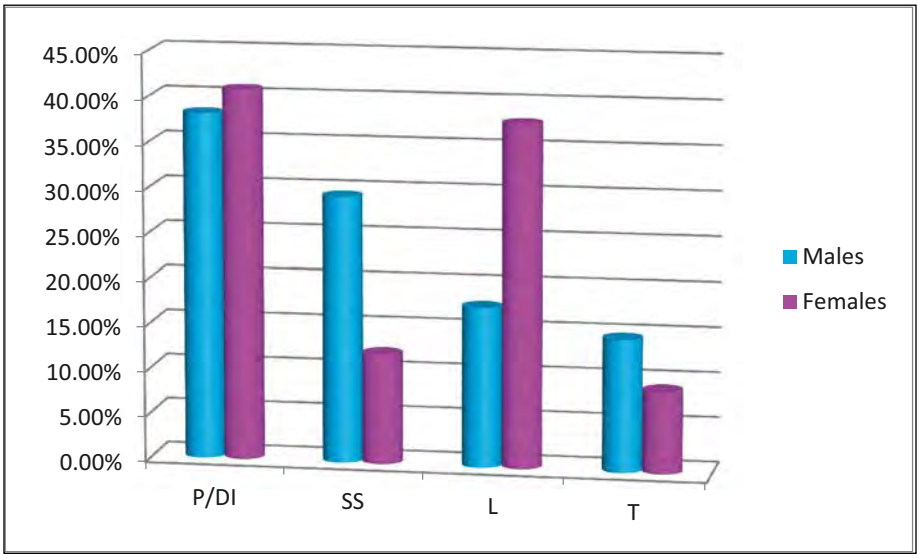

Figure 3. P- practicals, DI- dissections, SS- self-study, L- lecture, T- tuitorials.
(Kharb, Samanta, Jindal, & Singh, 2013.)

ferred teaching-learning methodology was lecture, whereas the male students preferred self-study (see Figure 3.).[11]

Dr. Dovi Weiss of Kibbutzim College of Education has several suggestions in improving the education experience.[12] Included are innovations recommended by Weiss enhanced by the current author.[13]

Virtual Reality

Virtual reality (VR) is a computer-generated, scenario-based simulation of realistic experiences, otherwise known as virtual training simulator (VTSim). Virtual learning environments combine the social interaction aspects of traditional classroom training with the digital world. Organizations are using virtual training coaches such as avatars that engage with the learners similarly to a human instructor. Companies are using online virtual platforms for delivering their training and are creating virtual environments to bring the human aspect into their eLearning environment.[14] This method of training is proven effective in giving the student experiential knowledge of supply processes before they even graduate!

Virtual environments and use of virtual avatars in training are a great medium to target Millennials (20- to 35-years-old), as they can create their own avatar and collaborate with others, depending on the programming.[15] Large Fortune 500 companies and agencies within the government are already using virtual platforms for meetings, interviews, and training. Additionally, the prices of video streaming devices have decreased significantly, enabling a greater return on investments.

Progressive Generation Training Solutions

It is becoming clear to eLearning professionals that standard LMSs, such as Moodle and Blackboard, are not enough to create effective learning—especially since most are not used as designed (within a formal setting versus in an eLearning/distance learning format). Since the world is becoming more interactive, gamed, and experience driven, training leaders and instructors should ensure that they are using training solutions that support the learning methods of the current and next generation, (the Progressive Generation). We teach using methods of the previous millennia discounting technology that this unique demographic of learners use every day for communications and learning. This is a serious flaw in our training processes.

The Progressive Generation training solution:

- Integrate a modern user interface for the learner (VTSim) versus (MTS)/ Oracle Users Productivity Kit.
- Offer activities that have high-level interactions while promoting social active learning (VTSim, learning management system [LMS], video streaming media).
- Integrate high-resolution formative assessment (video streaming media and VTSim).
- Include personalized experiences (field trips, guest speakers, virtual tours, VTSim).
- Include advanced and interesting scenario-based games (VTSim).
- Offer blended eLearning opportunities and systems that have mobile compatibility (mobile apps, classroom system Bluetooth capabilities).

It is important to note that only progressive generation training solutions that provides all of these capabilities will work properly for effective learning, as evidenced by the studies of Kharb, Samanta, Jindal, and Singh.[16]

Mobile Learning

Mobile learning involves learning across multiple contexts through social and learning content interactions and using personal electronic devices. The mobile proportion of Internet usage reached nearly 80 percent in 2018.[17] Universities and trade schools are embracing this trend and promoting the concept of the lifelong learner to learn anytime and anywhere. With students preferring to bring their own laptops, phones, or iPads with them to class, learning institutions are required to enable this capability. Mobile learning is here; this is a reality and we expect to see this effective use of mobile learning in the future. It is good business sense to embrace this technology since it is already in the possession of students and instructors. There is nothing the institution needs to provide except Wi-Fi or Bluetooth connectivity. By its very nature, profitability is guaranteed.

Advanced Formative Assessment

Formative assessment, including diagnostic testing, is a range of formal and informal assessment procedures conducted by trainers during the learning process. This enables the trainer to modify teaching and learning activities to improve student achievements and mastery of outcomes. It typically encompasses qualitative feedback (rather

than quantitative scores) for both the learner and instructor and focuses on the details of the content and performance of a task. It is commonly contrasted with summative assessments, which monitor educational outcomes, often for purposes of external accountability and consequences. Formative assessment can be based on the combination of achievements, progress, and participation in face-to-face and eLearning activities.

Learning Analysis

The term learning analysis tends to refer to the use of predictive and user behavior analytics. It should include certain advanced data analytics methods that extract value from large sets of descriptive and inferential statistics garnered from surveys and interviews. As additional digital learning activities take place, we have the potential to collect more data—which can unveil insights such as significance and correlations between variables (inferential), resulting in a better understanding of learning processes, behavior, and applications of mastered tasks in the Operating Forces. This will require a thorough review of the surveys being utilized at Ground Supply School and an understanding of what data is desired, how will it be utilized, measured, and for what end will the information be used.[18] Surveys are entirely useless unless those questions are answered.

Learning analytics tools can be used in realtime (instructor rating forms, end of phase critiques, exam rating forms) or at the end of the learning session (end of course critique). Realtime data can produce immediate actionable insights that are critical to the learning process, such as LMS analytic features within the gradebook program.

Video-Based Training

Eighty percent of video watchers viewed more videos in 2016 compared to 2015.[19] Video streaming occupies nearly 66 percent of the Internet space and is expected to jump to 82 percent by 2020.[20] YouTube, for example, became the second most popular search engine after Google.[21] Advanced training technologies and tools are enabling organizations to create cost-effective, video-based training programs. These programs are used not only in online courses but are also found in both traditional and blended educational venues. Video-based training is proven to be an effective medium for creating engaging learning modules and accomplishing learning objectives without the traditional costs associated with brick-and-mortar establishments.[22] In fact, video is the favorable learning medium for students between the ages 20 to 35-years-old.[23]

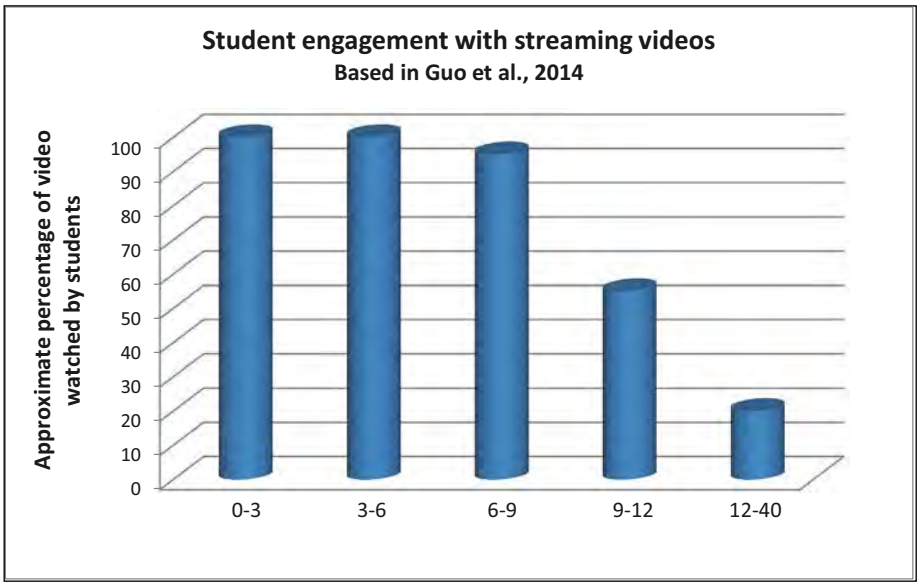

Figure 4. Student engagement with streaming videos. *(Guo, 2014.)*

Immersion is critical in a training environment where videos are used to supplement the lesson.

There are certain basic rules to apply to video usage in classes (eLearning-online and brick and mortar). Success is dependent on keeping the video short; keeping it personalized to the student demographic; being enthusiastic in tone, speed, and inflection in the voice; and keeping the pace as a conversation.[24] To achieve student engagement, which is critical for long-term memory, students must be intellectually engaged in the lesson.[25]

Immersion is critical in a training environment where videos are used to supplement the lesson. Immersion can involve any cognitive exercise such as scenario-based problem-solving, discussions, video summarization or critique, or any engagement that demands participation from group members (see Figure 4).[26]

The cost of video conferencing tools was reduced dramatically in recent years and is expected to fall even more as video streaming becomes more and more inculcated into everyday life. This fact pushes organizations to use such tools that involves video, voice and content collaboration, and communications technology such as Adobe Connect, Adobe Captivate, Facetime, and Skype as cost-effective video conferencing training tools.

The low cost and ease of video production pushed many instructors to create their own videos and video-based presentations. Office Mix for example, a free add-on to PowerPoint, enables any instructor to very easily produce video-based presentations (see Figure 5.).[27]

During the first quarter of 2017, it was found that online users aged 18 to 24-years spent an average of 176 minutes watching online videos via

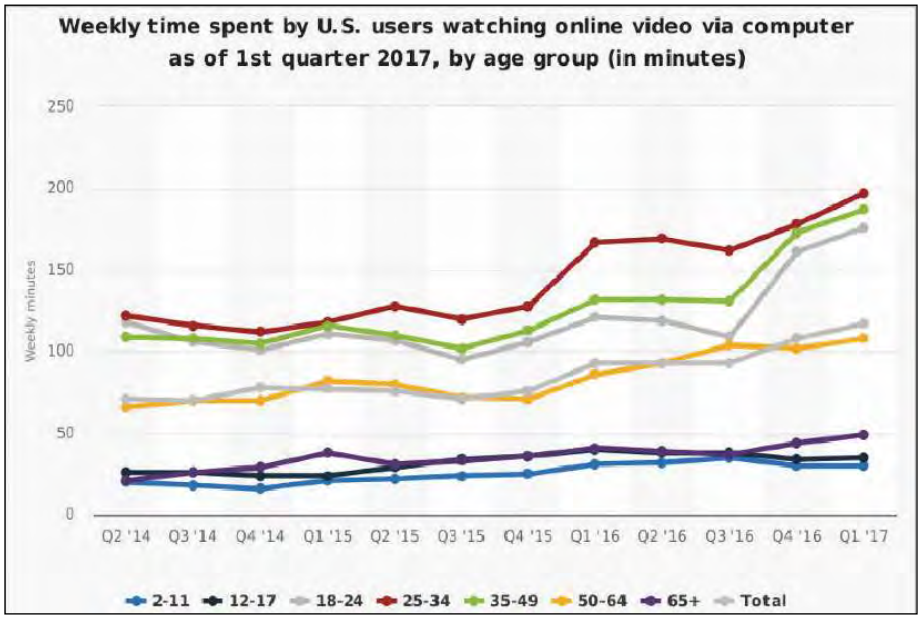

Figure 5. Weekly time spent watching online videos. *(Nielsen, 2017.)*

PC per week[28] with 81 percent of students using video to learn and getting higher grades.[29] This can be credited to research that images are processed 60,000 times faster than printed words with 40 percent of people responding better to visuals.[30]

Immersion

Immersion is best described as the student doing, seeing, and feeling. The instructor must demonstrate his ability to use visuals, gestures, body language, expressions, modeling, and movement to complement lesson cues. The instructor must be able to motivate students to achieve objectives through thoughtful challenges and intellectual exchange. Effective teachers, no matter the subject or setting, steer clear of questions that elicit only "yes or no" answers. Instead, they challenge students' thinking, nudging their higher-order cognitive skills and giving ample time to articulate each response. In immersion classrooms, it is especially important that teachers encourage students to give longer and more varied replies. This is challenging for most instructors because inside this technique is a threat of the student not having learned what was just presented thus requiring a re-teach. Despite this challenge, great rewards are presented with hearty discussions

and enjoyable exchanges of thoughts and ideas.

Effective instructors will mix the different types of interactions such as teacher-students, student-student, whole group, and small groups. In small-group and performance exercises, teachers need to carefully evaluate the size and makeup of each group ensuring every student can accomplish each enabling step of a task. Additionally, each student should work with various people in the class and not stay with the same group for every exercise. Instructors must enrich curriculum materials into visually rich, engaging training aids that include effective sets of activities and interactions (quizzes, multiple choice questions, role plays, matching, or group discussions).

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Interactions encourage the learner to own the lesson and desire to learn. They increase the learner's ability to express themselves, to be heard and seen, and feel valued and important.

Conclusion

When all these elements are present in our training solution, we will have the perfect combination of features to address the demands of the Operating Forces. The purchase, employment, and incorporation of Wi-Fi into our curriculum is paramount. A second priority is allowing all the capabilities that it provides. As educational leaders and school administrators, there are many considerations in guaranteeing mission accomplishment. The result of an effective learning experience that leads to better return on our training investment and the benefits it will bring to our Corps are well worth investing in the right solutions.

Notes

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12. Dovi Weiss, "The Top 7 Corporate Training Innovations Making the Biggest Impact in 2018," *elearning Industry*, (Online: June 2018).

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