

Gamification and Training the Technical Workforce

Embracing change

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In highly technical and rapidly evolving fields, such as data science, software engineering, analytics, artificial intelligence, and robotics, existing talent pools and training systems are not adequate to support a Marine Corps focused on modernization. This is a problem that will continue to grow in the coming years as competition for talent with industry and our sister Services generates an ever-shrinking available manpower pool from which to collectively draw. Worse yet, these are skills that are prone to atrophy and require constant life or career long education to maintain and keep pace with changes in academia and industry. To meet the technology focused challenges set forth in the *Commandant's Planning Guidance* (Washington, DC: July 2019), the Marine Corps should examine an alternative to traditional training and education methodologies and take a cue from the private sector by focusing on self-paced hands-on digital training environments. To date, the thinking of our most experienced leaders has recommended growing necessary talent in-house through traditional education and simulation, whereas all we need are “more reps” to gain the muscle memory required for the job. These efforts focus on intensive short duration exercises and courses, but an alternate solution for code and mathematical related knowledge, skills, and attitudes may be a continuous micro-learning model that “gamifies” training through incremental rewards.

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Investments in computer-based training, virtual ranges, and “bootcamp” style courses have proliferated across agencies and organizations. Community-wide modernization strategies have exploited these advancements to strengthen their proposals. However, not all repetition is created equal, and therein lies a potential flaw in the use of self-paced micro-learning for technical and mathematical skills. What pop culture has instilled in our psyche about the “10,000-hour rule,” made popular by famed author Malcolm Gladwell is his book *Outliers*, is that people attain mastery through deliberate practice. Experienced military leaders translate that into more repetitions in the most realistic conditions possible. While that has proven effective, it limits possible overall achievement. This is mainly because of the core limitations of isolated modeling and simulation: it is as realistic as one can afford but never 100 percent presentative of a real environment, and it does not allow for truly continuous learning. I do not think any Marine, no matter how dedicated, would want to participate continuously

in an exercise for 10,000 hours. Modeling and simulation provide only half of the elemental combination needed in a catalytic change; however, gamification techniques such as feedback loops, reward systems, and measures of healthy competition can fill the missing half by stimulating the representative arena with excitement and opportunity while providing them the opportunity to learn and train in shorter time increments.

Feedback loops create a mechanism for iteration. The first critical capability that gamification would bring to workforce development is an opportunity to evolve around a knowledge or skill requirement and an ability for the curriculum to mature along with the target demographic—creating a continuous feedback loop. Without feedback loops, training and education models are trapped in a time bubble and are only allowed to progress through lengthy curriculum review events which prove costly and time-consuming, and therefore occur infrequently. Inserting feedback mechanisms throughout the workforce lifecycle and empowering analysis of that feedback to alter the

trajectory of education and training allows us to shape how not only this talent is cultivated, but it also provides for a revolution in our approach to talent design. If we define the workforce life-cycle into distinct recruitment, training, education, employment, and retention phases, then organizations employing this model in complex and technical fields can identify positive and negative trends and can quickly pivot when things are less effective while reinforcing techniques that prove successful.

Developing and sustaining data science, analytics, and artificial intelligence skills will require steep cultural changes in our organizational behavior in order to be effective. We will have to begin to treat data as a strategic war-fighting asset and evaluate what data problems are worthy of artificial intelligence investments and which are better solved with statistical analysis or better data engineering. The best data-driven organizations in industry understand the emotional intelligence behind reinforcement mechanisms, like positive feedback over reprimand or ridicule, and focus on strengthening relationships among team members with differing strengths and weaknesses in order to overcome shortfalls over negative feedback systems.¹ By focusing on how we can identify and recruit the best talent, soliciting feedback from the team on what skills are lacking before hiring someone into a position, and effectively focusing retention efforts on the most qualified Marines, we can tailor organizational-level teams so that strengths are amplified and weaknesses are overcome. Furthermore, we can do this by surveying across the entire organization to identify what specific elements keep people around, which make people leave, and which are inconsequential. These two modern feedback system examples highlight how leaders and managers can deepen the insight into the organizational culture of their teams and leverage that knowledge for more productive operational and developmental cycles.

Perhaps the most accessible example of the successful use of feedback can be found in online video games. While older generations balk at a growing

video gaming culture, reports estimate 97 percent of youth play some form of video games, but what occurs in this environment is learning how to recover from failure. Through a continuous cycle of feedback mechanisms, video games continually incentivize players to complete new and increasingly difficult performance-based tasks, practiced through repetition. Ultimately competitive gamers learn, explore, and iterate on complex tasks until success is achieved.² The psychological need for achievement is met by accomplishing a more difficult task or acquiring a new skill, and then employing that new skill in increasingly more challenging environments. Traditional flat modeling and simulation promote gross, rote memorization earned through repetition and succeeds in inoculating the senses against stressful sight and sounds, ultimately reducing anxiety around dangerous or

because there is no visible metric. This breaks the feedback loop.

Many organizations provide paid time off or bonus compensation as a reward for superior performance. The Marine Corps, like the rest of the DOD, pursues a more Spartan approach. Our accolades and achievements are marked using citations, ribbons, and award nominations. Other highly specialized skills within the Marine Corps take this further and focus on specific skill mastery, such as the as the belt system of the Marine Corps Martial Arts Program or the beyond expert badging for top-level marksmanship competitors. While all of these approaches have a proven track record, they focus on core military skills and leave out Marines with higher levels of technical or scientific skills and knowledge that might not ever be identified, let alone effectively employed or rewarded. We are

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difficult tasks by forcing the development of new neural pathways. It is not designed around a building-block approach to “leveling up” with new skills toward mastery. Gamified feedback mechanisms encourage both frustration and excitement, thus, fostering a higher degree of total mental exposure and incremental development.

Reward systems delve deeper on a psychological level. One of the greatest challenges in growing highly technical skills within an organization has to do with discerning quality over quantity. Leaders have to weigh the value of additional manpower against acquiring fewer, more highly trained professionals. Asking our leaders to make that decision without any quantitative data means that we inevitably make subjective choices based on personal experience and instinct, making us effectively blind. We cannot weigh the pros and cons as we seek to develop more modern and technology focused organizations

not advocating for the creation more qualification badges or belts in these skills, instead we propose incentivizing our information warriors to innovate and pursue new and more advanced skills through a more modern approach to positive reinforcement. The Marine Corps already has the foundational tools necessary to create a highly competitive, innovation focused workforce through alternative forms of recognition.

In 1986, the Commandant, Gen P.X. Kelley signed *MCO 1650.17F, Military Incentive Awards Program* which, under the authority of DOD financial management regulations, grants the Commandant of the Marine Corps the authority to approve cash awards up to \$7,500 and authorizes local commanders to award amounts of up to \$5,000 out of Operations & Maintenance funds.³ In the digital services and software industries many companies, rather than adding additional full or part time employees to tackle specific

requirements make use of “bounty” programs and other coding contests to crowd-source solutions for challenging problems. These programs serve multiple purposes. The company pays out a relatively small reward and owns all resulting intellectual properties. Additionally, they benefit from a diverse field of experts focused on innovative solutions. Finally, they get to identify talent for future recruiting that they already know has expertise in the areas they are principally concerned with.

In 2019 alone, Google awarded up to \$6.5 million to recipients meeting those challenges for incremental improvements in the search for efficiency and artificial intelligence algorithms.⁴ Today, within the DOD organizations such as the National Security Innovation Network host and sponsor hackathon challenge events that partner “students, local practitioners, technologists, developers, academia, industry partners and the military as teams to conceptualize and demonstrate prototypes,” directed against wicked, complex problems. As in industry, winning teams receive cash prizes and the co-sponsor retains the intellectual property developed over that week.⁵ Were the Marine Corps to employ similar reward mechanics focused on small data, analytics, and artificial intelligence problems, we could tackle many of our current needs and develop a new mechanism for talent management as well as recruiting Marines and civilians for more advanced programs.

The creative reinvention of reward systems can move beyond basic ribbons, medals, and badges, or even one-time cash awards. With feedback mechanisms in place, senior leaders could establish decentralized innovation approaches where recipients get to not only earn a percentage of the money an organization saves with their solution, they also get an opportunity to work directly with the engineers who originally developed that solution to improve it. This combination nurtures healthy competition and builds an innovation enterprise.

Healthy competition can enable domain specific meritocracies that help organizations advance while fostering team building environments. Opening

with *healthy* is intentional. The Marine Corps has witnessed numerous attempts at fostering competition; but, thus far, these efforts have tended to promote tribalism, knowledge hoarding, and constrained communication; symptoms arising from an unhealthy workplace. However, when leaders succeed transformation occurs through the team building experience. A shared camaraderie toward a common, worthwhile goal develops. Competition should not focus on developing adversaries as much as creating an arena where teams can test their mite, wash, rinse, and repeat. A shared focus on success, and an environment where teams must work together to overcome a challenge, fosters a sense of shared community. It is within this type of community that benefits achieved only through competition appear. Benefits such as career-long mentors and coaches who provide performance feedback and guide skill development. Marines also get a creative play place for sparking innovation, one that they can access from anywhere in the world with an internet connection and a Common Access Card. They get recognition and pursue professionalization through certifications, online community leader boards, and stretch goals.⁶

Even stalwart organizations such as AT&T and American Express have hosted online creativity contests; for that matter, the Department of Health and Human Service has conducted “Shark Tank” style competitions and employed crowdfunding platforms like *Kickstarter* and *Indiegogo* to incubate innovative ideas compete for funding.⁷ These are all examples of different approaches toward generating a level of excitement and interest around innovative, continuous improvement. The use of gamification around competition, especially as it pertains to cultivating a highly skilled data science workforce, can exist as a center of gravity for recruiting and retaining talent.

Gamification sits as the missing element that would bookend traditional exercises focused on modeling and simulation and would foster solutions while growing critical new skills for the force. While some aspects of this are

achievable through more traditional means, by incorporating reward systems and feedback mechanisms into a healthy competition, we can forge an internal merit system that recognizes top performing teams while also building communities of interest for crowd-sourced problem solving. Feedback loops, reward systems, and healthy competition are a byproduct of gamification and they can enrich a workforce but represent only a sampling of a larger selection of new tools that will need to be adopted to grow the Marine Corps of tomorrow. Leaders are limited only by their imaginations and the definition of their goals. The future Corps, one in which gamification is common practice amongst organizations, would be a Service that embraces change and applies a decentralized approach to innovation, both of which could be the different between battlefield success or irrelevance.

Notes

1. Cord Himmelstein, “The Importance of the Employee Feedback Loop,” *Forbes*, (August 2018), available at <https://www.forbes.com>
2. Sandra Abrams and Hannah Gerber, “Achieving through the Feedback Loop: Videogames, Authentic Assessment, and Meaningful Learning,” *The English Journal*, (September 2013), available at <https://www.jstor.org>.
3. Headquarters Marine Corps, *MCO 1650.17F, Marine Corps Incentive Awards Program*, (Washington, DC: 1986).
4. Nick Kolakowski, “Google Bug Bounties Totaled \$6.5 Million Last Year,” *Insights*, (January 2020), available at <https://insights.dice.com>.
5. JAIC, “NSIN Announces ‘Into the Dataverse’ Hackathon Judges,” *NSIN*, (September 2019), available at <https://www.nsin.us>.
6. Doug White and Polly White, “Five Ways to Promote Healthy Competition,” *Entrepreneur*, (April 2017), available at <https://www.entrepreneur.com>.
7. Anil Rathi, “To Encourage Innovation, Make it a Competition,” *Harvard Business Review*, (November 2014), available at <https://hbr.org>.

