

Maximizing the Operational Leader's Potential Towards Intuitive Decision Making

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EXECUTIVE SUMMARY

Title: Maximizing the Operational Leader's Potential Towards Intuitive Decision Making

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Thesis: Future Marine leaders can better optimize their intuitive decision making abilities through education and training improvements focused on key skills identified by research.

Discussion: Success in war requires quick and competent decisions where the essence of command is decision making. Commanders use different decision making models, including analytical and intuitive. An intuitive decision making model identifies the first successful line of action (satisficing), whereas an analytical model identifies a most favorable line of action (optimizing). This paper defines intuitive decision making as *the ability to perceive or know useful military actions quickly without conscious effort, along a line of action intended to be followed by the commander to the accomplishment of the mission*. Intuitive decision making is the most used model by decision makers and current doctrine is in concurrence. Only experts are competent intuitive decision makers and it takes ten to fifteen years to gain the required experience. Experience, for intuitive decision making, is military knowledge and judgment. Inexperienced leaders cannot employ intuitive decision making competently; therefore, they must gain experience effectively and efficiently. Experienced leaders and current research provide insight into the skills required for intuitive decision making. Marines gain essential skills and experience through vicarious means of education, wargaming, combat simulations, and battlefield visualization techniques. Recent surveys indicate that uncertainty and ambiguity are not fully exploited in current education and training programs. Technology offers improved practicality and ease of setup for education and training exercises where there are current shortfalls. These improvements include simplicity, timeliness, and fun and are keys to gaining long term motivational learning, while past education and training techniques continue to apply to today's warfighters. Compact disc read-only-memory technology offers reasonable, practical, and applicable solutions to mimic enemy "will" in providing dilemma based training.

Conclusions: Intuitive decision making is not a mystery. Leaders have potential to develop this skill after attainment of pertinent experience -- real or vicarious. To foster experience, the Marines should implement long range plans that leverage technology to make learning fun, applicable, practical, easy to setup, and inexpensive. This process involves concentrating on young leaders to enhance expert warfighting skills and develop a well-organized body of warfighting knowledge. To groom future warfighters, the Marines should implement more rigorous decision making education and training techniques that include changing situations, time pressure, and friction. The Marines should also ensure that decision making education and training exercises include: (1) competent facilitators, (2) an operational/tactical scenario, (3) incomplete information, (4) duress,

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(5) dilemmas to force decisions, (6) decision justification, (7) critiques, and (8) repetition. After ten to fifteen years of practical, motivational education and training, based on fun and applicability, Marine leaders will develop competent intuitive decision making ability.

MAXIMIZING THE OPERATIONAL LEADER'S POTENTIAL TOWARDS INTUITIVE DECISION MAKING

The Marine Corps has ground to gain in developing operational commanders' intuitive decision making. Research suggests that current Marine Corps' professional education and training systems do not maximize a leader's intuitive development. By not fully exploiting the possibilities of intuitive decision making with its operational leaders the Marine Corps risks limiting its optimal operational tempo. This paper, focusing on the operational commander's intuitive decision making process, begins by addressing the importance of decisiveness in decision making. The paper moves on to outline prerequisites commanders employ in intuitive decision making followed by a discussion of the utility for intuitive decision making as a way to increase military operational tempo. The paper continues on to address just how operational commanders achieve intuitive skills and the potential to develop those skills. To help develop future leaders as intuitive decision makers, this paper will recommend educational and training techniques to implement and employ.

Military analysts agree that decisions are integral to action, but not the decision thought process one goes through. The act of war requires quick decisions. Carl Von Clausewitz characterized war as a clash between opposing wills and as, "an act of force to compel our enemy to do our will."¹ For the military to impose its will on the enemy, it must act.

"The essential thing is action. Action has three stages: the decision born of thought, the order or preparation for execution, and the execution itself. All three stages are governed by the will. The will is rooted in character..."²

As stated above, action has three stages. This paper will focus on the decision born of thought and its applicability in training future operational leaders.

THE DECISION -- THE ROLE OF LEADERS ON THE BATTLEFIELD³

The Department of Defense (DOD), within its Joint Publication (JP) 1-02, provides the following military definition of decision: "In an estimate of the situation, a clear and concise statement of the line of action intended to be followed by the commander as the one most favorable to the successful accomplishment of the mission."⁴ Major John F. Schmitt, USMCR, writing in the Marine Corps *Gazette*, states that the essence of command in battle is the art of decision making. As an art Schmitt reminds his readers that battlefield success is determined by results not intentions. Even the best decision executed poorly may result in defeat. Command, for Schmitt, produces numerous challenges and responsibilities to ensure mission success; However, he concludes that, "... the responsibility for making decisions is the domain of the commander and no one else. While the commander may solicit advice and suggestions from any of his subordinates, the decision on a specific course of action is his alone."⁵ Such conclusions bear truth as they are the lessons Marine leaders receive throughout their careers. As such, they also raise two related questions: (1) What is decision making, and (2) are there different models? The Marine Corps highlights the analytical and intuitive approaches to decision making in its draft Marine Corps Doctrinal Publication (MCDP) 5, *Planning*.⁶

INTUITIVE DECISION MAKING DEFINED

Intuitive decision making differs from analytical decision making. Webster's 1984 New World Dictionary defines intuitive as, "having to do with intuition" or "the ability to perceive or know things without conscious reasoning." This paper defines intuitive decision making as *the ability to perceive or know useful military actions quickly, without conscious effort, along a line of action intended to be followed by the commander to the accomplishment of the mission*. The definition does not specify the most favorable line of action, but a successful line of action. This requires the commander to make sound, time sensitive decisions under conditions of uncertainty. A commander's ability in this area requires much experience. For intuitive decision making, this paper defines experience as military knowledge and judgment. The commander gains this type of experience by active involvement with, the personal observation of others, or study of others making appropriate military decisions.

Differences Between Analytical and Intuitive Decision Making

Marine Corps doctrine describes analytical decision making as a process for optimizing military solutions. This process directs the commander and his staff to follow a prescribed series of steps to generate options and evaluate those options according to established criteria. In this manner the commander and staff identifies the best solution by studying the problem for analysis and comparison. The process works best when time allows a thorough problem analysis to determine an optimized solution.⁷ Major John F. Antal, USA, writing for the *Military Society*

of the Marine Corps University states that, (1) many military officers believe in the superiority of the analytical strategy, (2) staffs require more efficient methods of analysis, and (3) command cells receiving the proper tools can become more efficient at analytical decision making and solving tactical problems. However, he also concludes that analytical decision making relies on a high degree of certainty. This includes such critical elements as enemy combat readiness, terrain, weather and any other factors impacting on operations. This degree of certainty is often missing in combat.⁸

In addition to the unfavorable impact of uncertainty on the effectiveness of the analytical process, Dr. Gary A. Klein, a leader in decision making research, writes:

"An analytical strategy sounds good, however, in practice it is often disappointing. They do not work under time pressure because they take too long. Even when there is enough time, they require much work and lack flexibility for handling rapidly changing field conditions."⁹

In this quote, Klein reinforces the observations that limited time, changing conditions and uncertainty all make analytical decision making difficult and less effective.

How does a commander overcome uncertainty and time constraints while making decisions, and maintain flexibility while satisfying the requirements for appropriate action? The 1962 edition of the US Army's *FM 100-5, Operations*, states that:

"Although arrived at through an analytical and orderly process, the commander's decision is not merely a mathematical computation. It is an intuitive and creative act based on consideration of all the factors involved. Its soundness is a reflection of the commander's professional competence, experience, intelligence, perception, boldness, and strength of character."

In this passage, Army doctrine suggests that a commander outfitted with sound judgment can overcome uncertainty through intuitive and creative thinking, thereby filling in the uncertain factors to arrive at a satisfactory solution.

Experience helps the commander to fill in the uncertain factors and lay the foundation for sound intuitive decision making. Similar to this paper's definition of intuitive decision making is what Major Jose A. Picart, USA, describes as recognitional decision making -- a technique for making decisions based upon the intuitive knowledge or experience of the leader. Commanders who use intuitive decision making can make quick mental jumps in solving and wargaming a military problem. Picart calls this phenomenon of quick mental assessments *battlefield vision*. Recognitional (intuitive) decisions occur mentally when a leader rapidly identifies a situation and evaluates a practical course of action nearly simultaneously. He then implements, improves, or rejects it for another course of action "sequentially." Once a leader determines he has a working solution, he makes a decision and moves onto another problem.¹⁰ In this way the commander can speed his command's operational tempo.

Gaining operational tempo through intuitive decision making is desirable, but realizing always the danger associated with using intuitive decision making is that it appears easy. Clausewitz writes, "... one is left with the impression that great commanders manage matters in an easy, confident and, one would almost think, offhand sort of way."¹¹ For a novice military decision maker, that impression is not the reality. It is risky to let inexperienced personnel "shoot from the hip."¹² A study of military history supports the importance of experience when making military decisions. Successful commanders use this sort of decision making when working under time pressure in rapidly changing environments -- where inaction or slow action

may give the initiative to the enemy. After recognizing a need for quick action, the experienced commander will employ intuitive decision making and select the first satisfactory option, thus he mitigates risk attributed to slow operational tempo.

Uniqueness of Intuitive Decision Making

Experienced commanders, according to Klein, deliberate one option at a time. Their experience provides the enabling skills necessary to generate only plausible options despite uncertainty. This negates the need to compute the advantages and disadvantages of more than one option at a time. Klein determined that experienced decision makers do not search for the best option -- rather they concern themselves with one that works. By looking at one option at a time -- one plausible due to the commander's experiential insight -- the leader can decide quickly without considering other options. For Klein this is a strategy of "satisficing."¹³ Since experienced decision makers deliberate on few options for comparison, and attribute their decision ability to mysterious (intuition) processes, they often become defensive when questioned. Klein implies that this "intuition" is not meant to be mysterious. He describes this ability as a recognitional, pattern-matching process growing from experience allowing experienced decision makers better use of their valuable time on other tasks. As a result, they deliberate more than novices about the nature of the situation using recognitional strategies fifty to eighty percent of the time.¹⁴ Klein calls this a "recognition-primed decision (RPD)," equating to the intuitive decision making process outlined in this paper. Klein's thesis is that the decision maker employs RPD (intuitive decision making) supported by experience to recognize the key aspects of a situation. In so doing, the decision maker can react rapidly to situational problems

demand of him. Once the decision maker identifies an action plan, he can imagine outcomes as unit action transpires, assesses consequences and immediately note results. If the risks are too high, the competent intuitive decision maker can immediately modify weak plans with new plausible actions.¹⁵

Klein's additional studies identify the ten features of Naturalistic Decision Making (NDM), closely akin to this paper's intuitive decision making. Listed, they are:

1. Time pressure
2. Ill-defined goals
3. Dynamic conditions and shifting goals
4. Inadequate information (missing, ambiguous, erroneous)
5. Cue learning
6. Experienced decision making
7. Team coordination
8. Context (higher level goals, stress)
9. Poorly defined procedures
10. High stakes

For example, Klein's ten features impede analytical thinking and pressure the decision maker towards more intuitive models because they introduce uncertainty and often create pressures for quick decisions.

Klein advances seven additional claims concerning operational leaders use of NDM that also apply to Marine intuitive decision making. These relational claims are:

1. In operational settings, people try to find the first course of action that works, not the best one.
2. Decision making consists of two aspects -- assessing the situation and selecting the course of action.
3. Experienced decision makers can usually assess the situation quickly and accurately.
4. Once the situation is understood, the course of action decision is usually obvious.
5. Decision makers often must be prepared to act without fully examining the parameters and contingencies.
6. Decision making and problem solving are inter-related.
7. Decision makers arrive at a course of action by generating pertinent options rather than filtering out unacceptable options.

In short, Klein's research supports the idea that intuitive decision making is unique and different from analytical decision making and that experienced decision makers employ intuitive decision making more often than other decision making methods.¹⁶

PREREQUISITES FOR INTUITIVE DECISION MAKING

This paper acknowledges the fact that many great military commanders, acting intuitively, "have had the ability to view a situation, make a rapid assessment, and decide quickly on an appropriate action."¹⁷ Clausewitz called this ability *coup d'oeil*. By studying writings and observations contributed by classical warfighting historians, the Marine Corps can gain insight into *coup d'oeil* and intuitive decision making.

Observations from the Past

Clausewitz concludes, "When all is said and done, it really is the commander's *coup d'oeil*, his ability to see things simply, to identify the whole business of war completely with himself, that is the essence of good generalship. Only if the mind works in this comprehensive fashion can it achieve the freedom it needs to dominate events and not be dominated by them."¹⁸ *Coup d'oeil* is further defined as "a glance taking in a general view; the action or faculty of rapidly taking a general view of position and estimating its advantages and disadvantages."¹⁹ The noted military historian and theorist, Captain B. H. Liddell Hart defines it as,

"a blend of acute observation with swift-sure intuition; the ability to create surprise and throw the opponent off balance; the speed of thought and action that allows the opponent no chance of recovery; the combination of strategic and tactical sense; the power to win the devotion of troops, and get the utmost out of them."²⁰

Since *coup d 'oeil*, similar to what we term intuitive decision making, is a phenomenon recognized by a great many commanders, what are the essential building blocks for its development?

The 1939 writings of Canadian Major J. W. Howard, Ph.D., argue that experience in making tactical decisions constitutes an essential part of *coup d 'oeil* and intuitive decision making. He concludes that military officers bring imbedded knowledge when addressing tactical problems and military subjects. This imbedded knowledge produces the guidance necessary to resolve a given problem. Based on how well officers internalize their experiences, they can see and act on the individual parts of a given problem as a whole. Discerning the complexity of problem solving is key to the officer's performance for one cannot make good tactical decisions nor achieve satisfactory solutions by partial overview. "Insight appears suddenly and completely and its effectiveness as a satisfactory solution can be determined by passing judgment upon it or in other words by thinking about it."²¹

Recent Observations

More recent theorists have refined our understanding of intuitive decision making. Major Arthur J. Athens, USMCR, by aligning past observations on *coup d'oeil* with current intuitive decision making thinking, provides considerable insight into the development of those skills and their basic ingredients. Athens presents three primary prerequisites for intuitive decision making: (1) experience, (2) a well-organized knowledge base, and (3) metacognition. Athens defines metacognition as the self-awareness of one's expertise, which in turn helps further learning and decision making.²² He quotes from *The Teaching of Thinking*:

"Experts not only know they know more, they know better to use what they know, what they know is better organized and more readily accessible, and they know better how to learn still more."²³

In the process of deciding, Athens says, an intuitive decision maker, "scans the environment, looks for particular cues, assesses his situation, and relates what he observes to previous experiences." Like Howard, Athens writes that early in the process, the decision maker feels confident in a course of action and the objective he wants to achieve. He thinks on few alternatives, if any, and those only one at a time. When the decision maker contemplates on the course of action, he begins by broadly viewing it, then, progressively views it more narrowly testing it in his mind. Once he determines a favorable risk versus gain relationship, and that his plan will work, he decides the action. This means he chooses the first action that he determines is satisfactory for mission accomplishment.²⁴

THE UTILITY OF INTUITIVE DECISION MAKING

"Speed is the essence of war." Sun Tzu²⁵

Experienced intuitive decision makers are able to fill in the gaps when needed information is missing. By acting on such things as pattern recognition, the execution of orders can take place, preventing delays while awaiting complete information. The Marine Corps describes the utility of intuitive decision making in the draft MCDP 5, *Planning*:

"The intuitive approach is more appropriate for the majority of tactical decisions -- decisions made in the fluid condition of war when time and uncertainty are critical factors and creativity are desirable."²⁶

Additionally, the draft MCDP 5, *Planning* states: "Where decisions are simple or decision makers are highly experienced, planning may not be needed."²⁷ Both passages conclude that intuitive decision making speeds the production of orders because less detailed plans are required. In turn, a faster production of orders generates a faster operational tempo, facilitating the attainment of overwhelming tempo and momentum. The value of employing these skills becomes quite clear in preparing for future war. Even though the United States (US) finds itself with no immediate military peer competitor, it is not the time to slow the needed intuitive decision making training necessary to equip future operational leaders for war.

General Jack J. Sheehan, USMC, Commander in Chief, United States Atlantic Command, asserts that current world social, economic and cultural trends set an ominous warning and indication for unpredictable outbreaks of violence and troubled times ahead making future war likely.²⁸ Historians William Strauss and Neil Howe theorize that generational cycles influence the severity of America's wars, and that these cycles run a predictable path. If their generational hypothesis is correct, the US will enter a *Crisis* period in 2005 and exit in 2026. Strauss and Howe also deduce that previous wars fought by the US during *Crisis* periods were total wars fought with the most destructive weapons available.²⁹

If future war is likely to occur with highly destructive forces, then our nation needs leaders who can decide and act quickly against an unpredictable enemy. Because Marines think and act intuitively, a decision method which speeds operational tempo, it becomes imperative for future Marine leaders to develop intuitive decision making early to maximize its use. However, a question must be asked -- is intuitive decision making applicable in future war, warfare where analyzed *Information Superiority* and logic might make more sense?

Nature of future warfare

No one can predict with certainty where or when war will next strike the US. This paper will assume war will strike again. Likewise, no one can accurately assess the exact characteristics of future war. The Marine Corps assumes that uncertainty will remain as a characteristic of future war.³⁰ Accounting for these assumptions, General John M. Shalikashvili, Chairman of the Joint Chiefs of Staff, provides a framework for building future forces (Marines included) in his *Joint Vision 2010: Force of the Future*. The chairman articulates new operational concepts in his vision. He predicts that: (1) operational and employment complexities will increase, (2) that the DOD will employ smaller sized forces (Marine forces included), (3) that war will increase in lethality, (4) that the margins for errors will diminish, and (5) that leaders must learn to be innovative and capable of dealing with increasing degrees of ambiguity. In this type of environment -- the uncertain nature of war -- leaders must make decisions quickly, effectively and efficiently.³¹ Additionally, Sheehan asserts the need to streamline the decision cycle for commanders in future battlefields, where winning conflicts as rapidly and decisively as possible becomes ever more critical.³² How will Marines operate and make decisions quickly, effectively, and efficiently in a future environment of uncertainty (the domain of intuitive decision making)?

Past wars dealt with lethal, uncertain, and ambiguous situations. DOD believes that future war will have these characteristics. Therefore, we should learn from historical lessons dealing in uncertainty. Respected historian, Dr. Russel H. S. Stolfi, provides very insightful observations of how the German 7th Panzer Division (7.Pz.D.) performed amidst much

uncertainty in the May 1940 French Campaign, and the June-July 1941 invasion of The Soviet Union. The 7.Pz.D. accepted the uncertainty in war. The German officers in the 7.Pz.D. encouraged all the subordinate leaders to act, allowing leaders the possibility of making mistakes. For Stolfi the, "7.Pz.D. exemplified this philosophy: it was always right to act: it was always wrong to wait for more information, more troops, and more fire support to clear up uncertainty. Commanders Rommel and Funck, and the division exemplified this willingness to accept uncertainty, this determination to act, this preference of the oral order over the written."³³ As a result, the 7.Pz.D. achieved extraordinary results against first class opponents prepared for war. Rapid tempo aided their accomplishments. History teaches, thus the Marine Corps must continue to learn to operate in uncertainty and accept mistakes as a necessary risk in attaining operation tempo.³⁴ Also, it must continually strive, hone, and improve these skills that allow for decisive action in the midst of uncertainty.

Current Doctrine

Intuitive decision making is an integral part of a commander's ability to deal with uncertainty in order to increase operational tempo. *Maneuver Warfare* doctrine advocates making quicker decisions than one's enemy. The timeliness of decisions is a key to generating operational tempo and gaining an advantage over the enemy in initiative. In the emerging concept of *Operational Maneuver From The Sea* (OMETS), while landing forces maneuver from ship to objective, simultaneously the Marine Expeditionary Force (MEF) commander assesses timely intelligence, determines likely actions, and makes rapid decisions at key maneuver decision points. By maintaining

communication at all OMFTS levels, the MEF commander can act on the changing situation and maneuver landing forces accordingly. Failure to communicate forces subordinate commanders to make those maneuver decisions at key decision points.

"The operational environment of OMFTS is characterized by a dynamic, fluid situation. In such a chaotic situation, we require leaders and staffs who can tolerate ambiguity and uncertainty and make rapid decisions under stress."³⁵

Marine leaders must do everything possible to develop the intuitive decision process for all future leaders. Intuitive decision making allows for rapid responses based on keen appreciation attained from experience. This ability has applicability to all types of military operations from conventional to Operations Other than War (OOTW).³⁶

POTENTIAL FOR OPERATIONAL COMMANDERS TO ACQUIRE INTUITIVE DECISION MAKING SKILLS

"What any person in the world can learn, almost all persons can learn if provided with appropriate prior and current conditions of learning."³⁷

Commanders with *coup d 'oeil*, expert battlefield vision, or intuitive decision making ability -- parallels experts from other fields of study who do their jobs effortlessly, fluidly, and intuitively. According to the senior editor of *Psychology Today*, Robert J. Trotter, superior knowledge, and not superior memory, is the key to expert behavior. Superior knowledge grows from a large knowledge base born of practice. The expert gains an ability to perceive large meaningful patterns while developing a deep situational awareness in their field of expertise. This intensive and difficult process takes from "ten to fifteen years."³⁸ Consequently, a key to

learning over such a long time is the motivation derived from the fun of learning itself.³⁹ This does not negate the motivation derived from a sense of duty and professionalism, but if the fun of learning is absent, the motivation to learn lessens. Based on such conclusions, Marines should acquire the ability to educate and train their leaders, in ten to fifteen years, and achieve intuitive decision making capabilities (for officers this equates to the field grade level); provided that these leaders worked exceedingly hard, enjoyed it, and continued learning throughout their career.

There is no mystery to acquiring decision making skills. Education, training and experience can provide the basis for it. "Compressed time" is a key component in the nature of the future battlefield, a battlefield where maintaining overwhelming tempo will require intuitive decisions. Yet, the keys to these decisions, education and experience, are scarce commodities. To remedy this, future Marine leaders must gain experience by first hand knowledge or be provided such experiences in simulation warfare. Most military professionals encounter minimal combat. Marines operate in a predominate peacetime environment. Therefore, professional military education and training -- not necessarily participation in combat -- provide the primary vehicles future leaders gain decision making experiences. As stated earlier, these experiences must routinely occur to prompt leaders to make all types of decisions and maximize their intuitive decision making capabilities.⁴⁰

Essential Skills

These considerations raise the issue whether all leadership skills can be learned. Schmitt writes that decision making is an art. He claims that a solid knowledge base provides a foundation for a leader to apply experience (military knowledge and judgment). However, experience does not cancel the need for or the art of decision making. Schmitt also states that intuitive decision making requires the ability to recognize and analyze a problem with the ability to create a practical solution. For Schmitt, leaders require strong moral courage to make those tough decisions in the face of uncertainty knowing they must accept full responsibility of their decisions. The leader must understand the point at which he must make a decision when searching for additional information cannot justify the time and effort spent getting it.⁴¹

Many Marines either exhibit the essential skills outlined by Schmitt or can learn them through experience. Previously stated, this paper defined experience in the context of intuitive decision making, as military experience and knowledge. Military art, an intangible quality, can be developed to an artistic talent through practice. The potential to recognize a problem and analyze it, is largely a factor of experience. The ability to create a practical solution to a problem is a function of recognition, analysis and applying "art" in solving it. Repeated problem solving develops these abilities. Dealing in uncertainty, and exercising the moral courage to decide in the face of uncertainty, are difficult requirements to educate and train to. Uncertainty flourishes where inexperience and a lack of information exist. Lieutenant General Anthony C. Zinni, USMC, once said:

"... The biggest fear about not having enough information is the fear that you will make the wrong decision. That's never the problem. The problem is that you make no decision... We can go back, those of us in Viet Nam, (and remember) how many times units were frozen by one sniper shot, frozen by a contact! A whole company pinned

down! Uncertainty! What am I up against? What is he (the enemy) trying to do? I've got to have perfect information because I've got to make the right decision. And that's wrong! The worst thing that can happen to you is happening! You are making no decision! And that's what uncertainty causes. Inaction! Indecision! And that's the worst thing that can happen! Better a wrong decision here, clearly, anytime."⁴²

Zinni's arguments make clear the need to continually subject Marines to situations that require decisions and actions in the face of uncertainty. In doing so Marines educate, train, and build experienced leaders.

Gaining Experience

Indeed, intuitive decision making is an essential battlefield combat leadership skill requiring quick decisive action in an environment of uncertainty. Experienced leaders should possess it. Scientists have determined that intuitive people are experts in their particular field (military knowledge and judgment) and, that "Combat leaders will have the same amount of battlefield vision as they have warfighting expertise."⁴³ Remember Trotter's claim; it takes ten to fifteen years of intense study and learning in an enjoyable environment to sustain experience. How Marines gain experience apart from actual combat is through the vicarious means of, "education, wargaming, combat simulations, and battlefield visualization techniques."⁴⁴

Different Means that Provide Experience

Future Marines can use numerous methods to develop operational judgment within limited combat experience. These methods include: professional readings; historical battle studies; professional discussions; Tactical (or Operational) Decision Games (TDGs); map reading exercises; sand table exercises; tactical or operational rides; Situational Training

Exercises (STXs); Command Post Exercises (CPXs); and Field Training Exercises (FTXs). None of these methods are new. Their validity exists because they have stood the test of time.

In the 1907 translation of "*The Regimental War Game*," German officers state that exciting wargames, using field exercises, supplemented by tactical rides, are all valuable supplementary expedients for training officers. These techniques helped to develop the quick decision making agility, which characterized officers during the war of 1870-71. To properly conduct wargames, a facilitator must make the exercise interesting through the "power of imagination, in the power of illustration, in the power of good delivery, in the grasp and mastery of the situation, and in the power to adapt the discourse so as to appeal to the minds of the participants."⁴⁵ It is imperative to hold the interest of the participants and direct participants along the original theme. The Germans insisted on the "skillful conduct (of the wargame) by persons particularly fitted for the task, without regard to rank and length of service, as a preliminary condition."⁴⁶ Other wargaming principles incorporated between facilitator and players include:

- "1. The greatest possible simplicity of problems, especial importance being attached to operations of small organizations;
2. Curtailment of the written preliminary work;
3. Avoidance of problems which can only be solved by playing a great number of war games;
4. Importance of arriving at a decision in any situation;
5. Illustration of the most important principles of troop leading and of the tactics of the combined arms;
6. The use of dice only in exceptional cases; in their stead umpires, who give reasons for their decisions;

7. Substituting for the calculations of losses (still customary), the decisions of director or umpire, who gives reasons for his decision -- in fact, removal of every empty form, which impairs the liveliness of the game and reduces its value."⁴⁷

These requirements remain germane today, because they offer insight into making the vicarious experience fun, interesting, relevant and practical --a job for the facilitator. His ability lies in his genius with the application of the key requirements, a time consuming endeavor. Luckily, Marines today have augmented new tools to help make vicarious experiences even more interesting, relevant and practical for today's leaders.

New Tools Provide Improved Practicality

Today, computers, videos, teleconferencing, electronic mail, simulators, and simulations all provide valuable assistance to the facilitator and participants in a wargame. These means power the imagination, the illustration, the delivery, the situation and the discourse, to better appeal to the minds of the participants. Computers (functioning as modern dice) can facilitate or assist (offering possible solutions or explaining historic actions) in facilitating. Distances between Marine participants no longer enter the training equation. All participants can attain virtual proximity on a virtual battlefield as skillful conducting of wargames becomes more professional. Simplicity in execution and the curtailment of preliminary written work makes wargaming easier. So too does referee work. With these improvements to time tested expedients for training officers, Marines have greater applicability and potential in training leaders capable of intuitive decision making.

EDUCATION AND TRAINING -- WHO?

The DOD's National Military Strategy describes an operational environment of widespread and uncertain threats, into which Marines will be thrust.⁴⁸ Again, research suggests: (1) that individuals require approximately ten to fifteen years of experience to become experts in a field and exhibit intuitive decision making capabilities, and (2) that operational leaders make the majority of decisions intuitively when placed under time pressure. To meet these challenges, the Marine Corps must concentrate great effort at all levels in officer education and training. This is especially critical during the early formative years, to build and develop good foundations of military knowledge and judgment -- *experience*.

How Are We Doing?

Are Marine leaders being fully developed to confront an environment of ambiguity and uncertainty where decisive action requires quick satisfactory decisions to facilitate increased operational tempo? Current Marine doctrine requires leaders to exercise initiative and decision making in the absence of orders. General Charles C. Krulak, Commandant of the Marine Corps, contends that Marines can do a better job to increase the number of leaders with improved military knowledge and judgment, keys to intuitive decision making capabilities. He states:

"We have made tremendous progress "Making Marines;" We now need to move out smartly on "Winning Battles." Let me reiterate my comment from the Commandant's Planning Guidance: 'It is my intent that we reach the stage where we come to work and spend part of each day talking about warfighting: learning to think, making decisions, and being exposed to tactical and operational issues, My goal is to encourage short discussions that make us think daily about our warfighting philosophy and how we are going to execute it, and I want those discussions to occur regardless of MOS, current

assignment of location. I consider this a fundamental leadership responsibility of every commander and staff supervisors."

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The Commandant's guidance for education and training Marines in "Winning Battles" calls for Marine leaders who fully understand analytical and intuitive decision making and understand the differences between them with regard to their respective strengths and weaknesses. To strengthen these decision making methods, the Commandant instituted daily warfighting sessions with repeated tactical and operational decision making. A recent student survey of Marine officers attending the Marine Corps Command and Staff College (CSC) and the Amphibious Warfare School (AWS) in Quantico, Virginia, highlighted areas where the Marine Corps has done a good job in education and training and where improvements are needed to maximize intuitive decision making in its leaders.

Questionnaire Results

Students answered surveys (questions and compiled results provided in Appendix A) on January 17, 1997, from CSC and on February 9, 1997, from AWS. Student answers provided the basis for percentages and analysis. One hundred-one (101) CSC Marine officers and one hundred thirty-one (131) AWS Marine officers provided answers. Their average time on active duty was fifteen, and eight and one-half years respectively; the average time on active duty roughly corresponds with the ten to fifteen years required for expertise in a particular field. In addition, both student bodies had prior classes on decision making in which instructors presented the general concepts of analytical and intuitive decision making.

Understanding Decision Making

In comparing analytical against two intuitive decision making models, students chose from a list of descriptors (instructions encouraged more than one answer) best describing that model. For example, analytical decision making is best described as: (a) an art, (b) scientific, (c) highly dependent on experience, (d) precise, (e) guesswork, (f) minimally dependent on experience, and (g) other. The questionnaire posed the same question for recognitional and intuitive decision making. Results shown in figure 1:

Descriptors	CSC Analytical	AWS Analytical	CSC Recognitional	AWS Recognitional	CSC Intuitive	AWS Intuitive
(a)	16%	18%	36%	29%	58%	49%
(b)	75%	69%	6%	5%	2%	2%
(c)	33%	37%	85%	92%	69%	68%
(d)	26%	18%	2%	3%	3%	1%
(e)	1%	1%	4%	4%	11%	18%
(f)	13%	8%	2%	0%	2%	6%
(g)	5%	5%	3%	4%	0%	5%

Figure 1. Percentage of responses for descriptors of different decision making models.⁴⁹

These answers indicate a broad understanding of the concepts of the different decision making models. However, in total, approximately one in five students dropped the emphasis on experience when addressing intuitive decision making as opposed to recognitional. Also, in total, approximately one in ten respondents chose guesswork to describe recognitional and intuitive decision making. These answers regarding experience and guesswork highlight that a

portion of the students lack understanding. The questionnaire did not specify, but implied a difference between the recognitional and intuitive models. Marines well versed in these models should have answered questions on recognitional and intuitive decision making the same. To fix these misconceptions, standardized terminology describing the analytical and intuitive decision making models should be used in all Marine schools with greater emphasis being placed on teaching the differences, strengths and weaknesses.

Tied to understanding different decision making models, is the frequency or appropriate use of a particular model. When asked, CSC and AWS students employed analytical decision making during tactical problems approximately one quarter of the time, and both groups overwhelmingly agreed that they employed recognitional or intuitive decision making the majority of the time.⁵⁰ Their answers indicate that analytical decision making is not the model of choice during tactical operations giving credence to Klein's research -- leaders make a majority of decisions intuitively. Survey results suggest that CSC and AWS Marine officers agree with Klein's findings. Based on these findings, can one conclude that Marines maximize their potential towards development of intuitive decision making?

Marines pride themselves on their warfighting abilities. They boast of their extensive "real world" contingency experiences in the Fleet Marine Forces (FMF) where CSC respondents averaged eight and one-quarter years and AWS respondents averaged four years. If Marines overwhelmingly chose the "intuitive method" for making tactical decisions as the survey demonstrates, then future warfighting training should focus extensively towards this process.

Talking about Warfighting

The survey sought to determine the use of various common educational and training tools to develop tactical and operational experience (military knowledge and judgment) within FMF Marine leaders. The results indicate that Marines in the FMF do not take full advantage of developing their warfighting expertise. They have many tools available for leadership training, but many used them infrequently. CSC and AWS students gave one response to questions such as the following: while serving in operational forces (FMF) you participated in staff rides (SR): (a) more than twice a year, (b) twice a year, (c) once a year, (d) less than once a year, (e) never, or (f) on our own. The same question was asked for computer assisted wargames (CAW), TDGs, sand table exercises (ST), and battle studies (BTS). Results shown in figure 2:

Choice	CSC SR	AWS SR	CSC CAW	AWS CAW	CSC TDG	AWS TDG	CSC ST	AWS ST	CSC BTS	AWS BTS
(a)	7%	2%	10%	5%	33%	36%	44%	27%	13%	8%
(b)	12%	5%	12%	6%	14%	10%	15%	10%	12%	8%
(c)	17%	10%	21%	10%	12%	2%	12%	5%	15%	16%
(d)	25%	18%	15%	10%	13%	7%	6%	9%	17%	12%
(e)	39%	65%	43%	67%	29%	42%	22%	49%	43%	53%
(f)	4%	0%	0%	2%	1%	5%	0%	1%	1%	2%

Figure 2. Percentage of responses on frequency of using different training tools.⁵¹

Why these results? Are staff rides and battle studies so difficult that nearly three quarters of the respondents take advantage of them less than once each year? Over half do not actively participate in two computer assisted wargames each year; despite the overwhelming majority reporting easy access to a home or work computer.⁵² The *Gazette* publishes TDGs each month,

yet fewer than half of the respondents actively participate twice each year. Why such an infrequent use of these available educational and training tools in the FMF? Why are Marine leaders not using these tools more frequently as a means to teach military knowledge and develop tactical and operational judgment?

Time management in the FMF is important, especially with the many competing interests requiring time from leaders, which detract from warfighting. As an example, the 1st Marine Division will source personnel and equipment in support of the Corps' public and community efforts, as well as National foreign relations. These commitments (non-operational tasks) increase the already heavy operational tempo brought about by cutbacks with no commensurate reduction in assigned missions. The cumulative effect of non-operational tasks distracts from a focus on warfighting.⁵³ These conditions faced by the 1st Marine Division are systemic of most FMF commands; additionally, staff rides, computer assisted war games, TDGs, sand table exercises, and battle studies take time and effort on part of the facilitator to conduct. Making better use of today's new educational and training tools mitigate the competing issues that take time away from our FMF leaders.

Resident professional military education (PME) devotes uninterrupted time to studying warfighting; therefore, it currently provides the best environment for conducting wargaming exercises. Survey results indicate that CSC and AWS conduct staff rides, computer assisted war games, TDGs, sand table exercises, and battle studies routinely, unlike the ease with FMF units. Zinni has commented, "Our schools do a good job. The problem is that education in the Marine Corps only takes place there, and does not continue in the EME... Too many leaders are afraid to learn from their Lieutenants or Noncommissioned Officers."⁵⁴ CSC and AWS students gain

vicarious experience in conducting numerous battle studies in their requirements to "analyze the battles specifically in terms of lessons applicable to war fighting in all times and all places."⁵⁵

Unfortunately, because of selected enrollment, limited opportunities are afforded to Marines to spend in resident PME. Survey results indicated that CSC and AWS students averaged two and one-quarter, and one and one-half career years in study respectively.

Learning about Friction and Uncertainty

"Situations in war are of unlimited variety, they change often and suddenly and only rarely are from the first discernible. Incalculable elements are often of great influence. The independent will of the enemy is pitted against ours. Friction and mistakes are of everyday occurrence"⁵⁶

The survey sought to determine the degree uncertainty and friction played in decision making during different educational and training techniques at CSC, AWS and in the FMF. The results indicate that Marine leaders fail to exhaust the full advantage of these techniques in developing warfighting expertise. CSC and AWS students responded to a series of questions based on active participation in various exercises. For example, during your staff rides (SR), please circle the training techniques that pertain: (a) a leader (facilitator) created a tactical/operational scenario, (b) you were provided with incomplete information, (c) duress was present (i.e. time limit, changing situations, etc.), (d) a decision was required, (e) you had to justify your decision, (f) the decision was critiqued, and (g) other. The same question was asked of computer assisted wargames (CAW), TDGs, sand table exercises (ST), and battle studies (BTS). Results shown in figure 3:

Choice	CSC SR	AWS SR	CSC CAW	AWS CAW	CSC TDG	AWS TDG	CSC ST	AWS ST	CSC BTS	AWS BTS
(a)	53%	56%	27%	22%	59%	79%	52%	85%	32%	27%
(b)	14%	34%	27%	23%	43%	76%	41%	78%	18%	19%
(c)	17%	29%	32%	21%	40%	61%	41%	69%	13%	11%
(d)	37%	42%	34%	26%	53%	83%	54%	82%	31%	26%
(e)	44%	53%	30%	17%	50%	73%	49%	78%	23%	27%
(f)	41%	43%	27%	20%	54%	40%	48%	75%	28%	21%
(g)	4%	2%	2%	7%	1%	2%	2%	3%	3%	7%

Figure 3. Percentage of responses to frequency of using different training techniques.⁵⁷

These findings indicate that many leaders are not forced to make decisions during these type of exercises and if so, duress plays little into the process. Recall that most Marines participate less than twice a year in any one of these different exercises. Add to that, many exercise decisions are made in a stress free environment. A conclusion drawn indicates that many Marines do not complete training exercises under induced friction and uncertainty but prefer to exercise with minimal friction and uncertainty. Recall Zinni's comment that "too many leaders are afraid to learn from their Lieutenants or Noncommissioned Officers." Why? First, perhaps the answer is partially due to the relative ease of decision making when facilitators introduce minimal friction and uncertainty. Second, an answer could be that leaders are very uncomfortable making mistakes in front of superiors, peers and subordinates. Training under these types of conditions does not provide realistic education and training.

ACTIONS REQUIRED TO MAXIMIZE INTUITIVE DECISION MAKING WITHIN FUTURE OPERATIONAL COMMANDERS

The requirement to strengthen intuitive decision making in our future leaders is essential. The challenge is to develop expert warfighters, because expert warfighters possess well-developed intuitive decision making capabilities. The Marine Corps needs operational leaders with a developed "extensive well-organized body of warfighting knowledge." Michael I. Posner of the University of Oregon, a respected scientist in cognitive processes reasoned that "producing an expert may be not so much in selecting someone who has special capabilities but to create and maintain the motivation needed for long-continued training."⁵⁸

The Marine Corps' long range education and training plans should be doctrinally based and integral in development of future MEF commanders decision making capabilities.⁵⁹ The Marine Corps must establish goals to better focus on Marine leadership education and training programs. Additionally, each of these goals have requisite skills, which become the building blocks in attaining the goals. Finally, the Marine Corps should enforce proper education and training techniques within the spirit of FMFM 1, *Warfighting*, with the objectives of efficiency and effectiveness in developing the skills and goals required of our future operational leaders.

Education and Training Goals

The Marine Corps should adopt three training goals in planning the development of its future operational commanders. First, Marine training should lead its future leaders through an

orderly training cycle to produce expert warfighters. Second, these future leaders must develop an extensive well-organized body of warfighting knowledge. Finally, the most difficult, future operational commanders must attain the ability for metacognition:

An attainment of these goals will maximize intuitive capability for future operational leaders. These inextricably linked goals require leaders expertise in all to maximize intuitive decision making. Most Marines will argue that these goals are nothing new, and for the most part, they are correct. However, the need to re-focus education and training programs on the various building block skills to meet the goals is still germane. It soon becomes apparent to the educator and trainer that the goals and requisite skills all overlap and interact with each other.

Requisite Leader Skills

There are primary skills required for young leaders to become expert warfighters. Keeping in mind the overlapping nature of the skills with the three goals previously mentioned, research and military history cite certain skills as being critical elements in warfighting expertise associated with intuitive decision making. To mold young leaders into expert warfighters -- with The Basic School (TBS) as an officer career starting point -- the Marine Corps must develop in them the following skills:

1. The ability to overcome uncertainty;
2. The ability to quickly deliberate on the nature/estimate of a situation;
3. Rapid decision making;
4. Increasing operational tempo;
5. To overcome fluid operational environments;
6. To understand the nature of friction;
7. To war-game within the minds eye (imagination);
8. Speedy action;
9. Boldness in actions;
10. To issue oral orders;
11. To use initiative during periods of uncertainty;

12. To apply creativity;
13. Understanding the concept of satisficing;
14. Knowing that is always right to act.

A continuous development in these skills will hone a future Marine warfighter. However, by no means an exhaustive list, intuitive decision making requires more.

Through constant education and training, the Marine leader must build an extensive and well-organized body of warfighting knowledge to establish a useful base of experience. This experience base is critical to intuitive decision making. This Marine Corps base of experience should include:

1. Decision making born of thought;
2. Tactical insight;
3. Self confidence;
4. Accepting responsibility for decisions;
5. Professional competence;
6. Accepting subordinate mistakes;
7. Organizing knowledge.

Marine leaders attain an extensive and well-organized body of warfighting knowledge by development in these skills. There are additional skills associated with the third goal required of leaders to maximize their intuitive capabilities.

The most difficult goal to acquire related to intuitive decision making is the development of metacognition. Gifted leaders who attain metacognition should be the ideal goal of all MEF commanders. Not all Marines will attain this, nevertheless, the Marine Corps should place emphasis in education and training programs to help develop metacognition. Leaders who develop metacognition skills possess:

1. Ascertaining a good operational sense;
2. Understanding the single battlespace concept;
3. Ability to draw from a vast experience base;
4. Articulating useful military perceptions without conscience effort;
5. Performing habitual decision making.

Attainment of these skills will help leaders maximize their intuitive decision making capability.

The education and training methods necessary to attain such skills and goals will require a sustained effort, as discussed below.

Education and Training Techniques (Dilemma -Based Training)⁶⁰

"The key to successful operational leader training resides in a philosophy that recognizes that war is a two-sided, competitive, no-holds-barred contest. Training must be interactive and competitive in order to meet these demands. Training must employ techniques of wargaming to produce the conditions to fully challenge the leaders decision making process. The real education will come in the game."⁶¹

FMF commands use the majority of available education and training time on procedures, techniques and tactics. Unfortunately, many commanders overlook the possibilities to educate and train leaders in operational judgment. This gap in leadership development of operational judgment is often due to poor education and training techniques. Operational judgment is understood to pertain to concepts of the operational level of war and the winning of campaigns.

Marines are introduced to "operational judgment" in professional military schools, professional readings, or during actual contingencies. With a sound background in tactical judgment, leaders can master operational judgment to a far higher level than is now commonly achieved in the FMF. A variety of methods are used to train leaders in tactical judgment. These can easily be modified to maximize operational judgment. Among them are Field Training Exercises (FTX), Command Post Exercises (CPX), Situational Training Exercises (STX), Tactical/Operational Decision Games (TDG), Tactical/Operational Exercises Without Troops (TEWT), and Map Exercises and a host of other learning tools. Whether Marines use these exercises, eight fundamental requirements, common to any educating or training method, can yield growth in operational judgment:

1. Assign a competent training facilitator;
2. Create an operational or tactical scenario;
3. Provide participants with incomplete information;
4. Create duress;
5. Place decision makers in a dilemma and force a decision;
6. Decision makers must justify their decisions;
7. Conduct critiques;
8. Repetition.⁶²

A thorough implementation of these fundamentals can foster desired intuitive decision making skills.

First, commanders must assign an education and training facilitator. The assignment of a facilitator is critical. The individual must be competent, able to carry out the facilitating task to ensure educational and training interest within the participants. If the exercise is computer assisted or controlled, the facilitator may be the computer itself

Second, create an operational or tactical scenario -- or any combination of the two -- to educate and train leaders. A realistic and challenging scenario is a primary place to develop a leader's operational senses and single battlespace concepts. Tactical wargaming scenarios allow a platform for future leaders to become familiar with the concepts and comfortable dealing with them. Marines enhance their training, whether conducting immediate action drills, live fire, fictional planning exercises, or classes conducted on situational tactics and operational concepts when provided a realistic operational contingency. In staging a realistic scenario, facilitators can create dilemmas that maximize interest and create vicarious experiences for the learners and leaders involved.

Third, do not provide complete information to the participants during the scenario. By not providing a complete picture of the situation, the facilitator creates uncertainty. The facilitator can do this in a variety of ways. Force the decision makers to make assumptions on

the enemy's real strength, on how terrain affords the enemy an advantage or disadvantage, and how the exact friendly situation is. Simulation information gaps create a situation similar to combat where leaders learn to cope with uncertainty and make estimates of the situation intuitively. In these manners, facilitators force leaders to deliberate on the nature of the situation and learn from the experience.

Fourth, create duress for the participants during the educating or training session. Warfare is very stressful. Facilitator can create stress in educating and training through fatigue, a changing situation, restraints and especially time constraints. Placing Marines under appropriate types of duress can teach the necessity of speed in decision making (time limit) or create a sense of urgency towards increasing operational tempo (enemy actions). By creating duress the facilitator forces leaders to overcome fluid operational environments (changing situation) enabling participants to gain experience with the nature of friction. By developing the skill for speedy decision making, future leaders acquire internal war-gaming skills (imagination). To strengthen and teach the inexperienced decision maker, facilitators should grant more information, more time to make the decision, and introduce less change and friction. As young officers adjust to working under duress in making decisions, higher the stress level by reducing available time, causing more friction, etc. A responsible facilitator will continually raise the stakes and create greater challenges for his trainees.

Fifth, facilitators should place leaders in a dilemma and force them to make decisions and commit themselves to an action. Forcing action helps to develop boldness, initiative, creativity, and the concept of satisficing. Though not easy for the inexperienced officer to make adjustments, facilitators should understand the importance of applying multiple variables of

duress (fatigue, time, friction) and force participants to issue decisions the same way they would during war (e.g., oral fragmentary orders, written concept of operations, etc.). The intent is to teach young leaders the importance of making a good decision quickly, not to necessarily make the perfect decision. The young leader must learn that it is always right to act. Action is key.

Sixth, decision makers must justify their decisions in front of peers and be responsible for those decisions. A face-to-face defense of ones own decisions, demonstrates assurance that they thought through them. If they used intuitive decision making, take the time to step back and analyze the decision and the process. Allow the decision makers to go through and analyze their commander's estimate of the situation. This contributes to decision making born of thought as opposed to guesswork -- a dangerous tendency for inexperienced leaders. During justification, decision makers may decide on a better choice. Explaining how a decision was arrived at gives addition tactical insight, which benefits the group. Explaining why a particular course of action was chosen demonstrates for all involved, the logic of their decisions. This helps to develop self-confidence and at the same time, allows participants to increase their experience base.

Seventh, conduct a critique at the end of the event or during opportune times. Facilitators will lead this critique. Here, all the decision makers discuss the decisions made, the reasons leading up to the decisions, the alternatives considered, and the decisive factors for the decisions. Never humiliate a subordinate. It is crucial that all leaders develop their aptitude to absorb honest mistakes. Critiques reinforce good logic and draw out better alternatives to poor decisions by examining the probable results of those decisions. In this manner, the exercises raise professional competence enabling all Marines to grow in operational and tactical judgment while adding to their knowledge base.

Eight, behaviorists have told us that the best way to make better decision makers is to have leaders make decisions repeatedly. The commander must ensure that leaders understand that repetition is necessary for dilemma-based educating and training to cause a real growth in a leader's tactical and operational judgment. Repetition leads to experience and habitual decision making. Further, by discussing and sharing the logic behind decisions, people will make quicker and better decisions. Over time, many leaders can develop the ability to articulate useful military perceptions without noticeable effort and develop and maximize their intuitive decision making capabilities.

CONCLUSION

"Decision making skills can be developed many ways -- through discussions, tactical decision games, battlefield studies, computer-based wargames, and others. I am not going to direct how military thinking and decision making exercises will be implemented throughout the Corps. Marines have always been innovators and I am confident that creative ideas will be generated locally."

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In developing intuitive decision makers who can optimize operational tempo, the Marine Corps must leverage technology to make education and training fun, simple, inexpensive and professional. There is no substitute for real life experience, but warfare has its costs in lives and material. Ensuring the exercise facilitator has the time, experience, and professional skills necessary to carry out the education and training required to produce intuitive decision makers is key. Computers, videos, teleconferencing, electronic mail, simulators, and simulations can all provide valuable assistance to a leader and his Marines; however, poor training techniques render

these tools largely ineffective if Marines do not make decisions under the general characteristics of war to include: (1) changing situations, (2) time pressure, and (3) friction and uncertainty. Additionally, decisions are not as valuable if decision makers do not analyze, discuss, and critique in front of superiors, peers, and subordinates -- namely, the techniques in dilemma training. Finally, the Marine Corps must fully implement the education and training techniques prescribed in this paper with its most junior leaders -- with the goal of intuitive decision making in ten to fifteen years. How can technology make this education and training easier and more effective? Is the enemy the best teacher for the professional soldier?

"There is no teacher but the enemy. No one but the enemy will ever tell you what the enemy is going to do. No one but the enemy will ever teach you how to destroy and conquer. Only the enemy shows you where you are weak. Only the enemy tells you where his is strong. And the only rules of the game are what you can do to him and what you can stop him from doing."⁶³

Military experience gained in fighting an enemy is the best teacher, but fighting an enemy is costly in materials and lives. How to best gain experience without the cost associated with war becomes the question. One solution may lie in compact disc, read-only-memory (CD ROM) computer game technologies. Computers have a remarkable capacity to mimic an enemy's "will," providing very lively interactive play. The Marine Corps can contract out to produce a CD ROM for entry level Marines from the rank of private to corporal. Similarly, Marines can produce one for 2d and 1st Lieutenants. Then the Marine Corps should provide a new CD ROM for each rank attained at promotion. Operational concepts are easy to program into a game scenario for those ranks that attain competency at the tactical level. This would be a great tool to teach new concepts and reiterate concerns that get highlighted -- force protection. Base libraries should set up with a computer room for those Marines without access to

computers. However, since many Marines now own their own computers or have ready access to computers at work, leadership should allow Marines to buy additional CD ROMs for higher ranks at the individual's own discretion. As Marines play different levels on their CD ROM they store their results on computer files. At appropriate times they would then submit their results through electronic-mail to a central location as a prerequisite for promotion to the next rank. Marine leaders can monitor a process for ensuring individuals provide justification and critique of game results.

Intuitive decision making is not a mystery. Leaders have the potential to develop this skill with study and the development of an extensive knowledge base gained from experience --real or vicarious. Education and training that is fun, simple, inexpensive and professional has become more practical with the advance of new technologies. The Marine Corps can do better --we can develop intuitive decision makers -- we can maximize operational tempo.

APPENDIX A: QUESTIONNAIRE RESULTS

Marine Corps Command and Staff College (CSC) and Amphibious Warfare Students
(AWS) from Quantico, Virginia provided responses to this questionnaire.

CSC	AWS	GENERAL BACKGROUND
97-01-17	97-02-09	Date survey completed.
average 2yr	Average 1yr 6m	Years of attendance in resident professional military education.
average 8yr 2m	average 4yr	Years of service in operational forces (FMF) in your primary MOS.
average 15yr	average 8yr 6m	Total years of active duty service.
101	131	Total number of respondents.
CSC Responses	AWS Responses	Survey Questions -- DECISION MAKING MODEL COMPARISON
		1. Analytical decision making is best described as:
16	24	a. an art
76	90	b. scientific
33	49	c. highly dependent on experience
26	24	d. precise
1	1	e. guesswork
13	11	f. minimally dependent on experience
5	7	g. Other
		2. Recognitional decision making is best described as:
36	38	a. an art
6	7	b. scientific
86	120	c. highly dependent on experience
2	4	d. precise
4	5	e. guesswork
13	0	f. minimally dependent on experience
3	5	g. Other

CSC Responses	AWS Responses	Survey Questions -- DECISION MAKING MODEL COMPARISON
		3. Intuitive decision making is best described as:
59	64	a. an art
2	3	b. scientific
70	89	c. highly dependent on experience
3	1	d. precise
11	23	e. guesswork
2	8	f. minimally dependent on experience
0	6	g. Other
		4. During tactical problems the decision making technique you employ the most is:
24	34	a. analytical
47	69	b. recognitional
41	48	c. intuitive
9	7	d. Other
		5. Rate your understanding of the decision making process:
28	32	a. high
67	86	b. medium
6	12	c. low
0	3	d. Other
		6. You attained most of your current understanding of the decision making process from:
5	7	a. nonresident professional military education
50	76	b. resident professional military education
66	64	c. practical application in the FMF (operating forces)
9	13	d. civilian schooling
7	10	e. Other

CSC Responses	AWS Responses	Survey Questions -- PERTAINING TO STAFF RIDES
		7. While serving in operational forces (FMF) you participated in staff rides:
7	2	a. more than twice a year
12	6	b. twice a year
17	13	c. once a year
25	23	d. less than once a year
39	85	e. never
4	0	f. on your own
		8. During resident professional military education you participated in staff rides:
30	118	a. more than twice a year
54	9	b. twice a year
10	1	c. once a year
2	1	d. less than once a year
5	2	e. never
		9. During your staff rides did you render tactical or operational decisions:
26	39	a. No
74	93	b. Yes
		10. If yes to the previous question, please circle the training techniques that pertain:
54	74	a. a leader (facilitator) created a tactical/operational scenario
14	45	b. you were provided with incomplete information
17	38	c. duress was present (i.e. time limit, changing situations, etc.)
37	55	d. a decision was required
45	69	e. you had to justify your decision
41	56	f. the decision was critiqued
4	3	g. Other

CSC Responses	AWS Responses	Survey Questions -- ON COMPUTER ASSISTED WARGAMES
		11. While serving in operational forces (FMF) you participated in computer assisted war games:
10	7	a. more than twice a year
12	8	b. twice a year
21	13	c. once a year
15	13	d. less than once a year
43	88	e. never
0	2	f. on your own
		12. During resident professional military education you participated in computer assisted wargames:
14	5	a. more than twice a year
9	9	b. twice a year
16	9	c. once a year
10	4	d. less than once a year
52	104	e. never
		13. During the war games did you render tactical or operational decisions:
41	60	a. No
49	46	b. Yes
		14. If yes to the previous question, please circle the training techniques that pertain:
27	29	a. a leader (facilitator) created a tactical/operational scenario
27	30	b. you were provided with incomplete information
32	28	c. duress was present (i.e. time limit, changing situations, etc.)
34	34	d. a decision was required
30	22	e. you had to justify your decision
27	26	f. the decision was critiqued
2	9	g. Other

CSC Responses	AWS Responses	Survey Questions -- ON TACTICAL DECISION GAMES
		15. While serving in operational forces (FMF) you participated in tactical decision games (non computer):
33	47	a. more than twice a year
14	13	b. twice a year
12	2	c. once a year
13	9	d. less than once a year
29	55	e. never
1	7	f. on your own
		16. During resident professional military education you participated in tactical decision games (non computer):
39	122	a. more than twice a year
21	4	b. twice a year
18	0	c. once a year
3	0	d. less than once a year
19	3	e. never
		17. During the tactical decision games did you render tactical or operational decisions:
16	4	a. No
77	126	b. Yes
		18. If yes to the previous question, please circle the training techniques that pertain:
60	104	a. a leader (facilitator) created a tactical/operational scenario
43	100	b. you were provided with incomplete information
40	80	c. duress was present (i.e. time limit, changing situations, etc.)
54	109	d. a decision was required
51	96	e. you had to justify your decision
55	92	f. the decision was critiqued
1	3	g. Other

CSC Responses	AWS Responses	Survey Questions -- ON SAND TABLE EXERCISES
		19. While serving in operational forces (FMF) you participated in sand table exercises (board or map exercises):
45	35	a. more than twice a year
15	13	b. twice a year
12	6	c. once a year
6	12	d. less than once a year
22	64	e. never
0	1	f. on your own
		20. During resident professional military education you participated in sand table exercises (board or map exercises):
30	124	a. more than twice a year
20	3	b. twice a year
15	1	c. once a year
3	0	d. less than once a year
24	3	e. never
		21. During the sand table exercises (board or map exercises) did you render tactical or operational decisions:
26	4	a. No
68	125	b. Yes
		22. If yes to the previous question, please circle the training techniques that pertain:
53	111	a. a leader (facilitator) created a tactical/operational scenario
41	102	b. you were provided with incomplete information
41	90	c. duress was present (i.e. time limit, changing situations, etc.)
55	108	d. a decision was required
50	102	e. you had to justify your decision
49	98	f. the decision was critiqued
2	4	g. Other

CSC Responses	AWS Responses	Survey Questions-- ON BATTLE STUDIES
		23. While serving in operational forces (FMF) you participated in battle studies:
13	10	a. more than twice a year
12	10	b. twice a year
15	21	c. once a year
17	16	d. less than once a year
43	70	e. never
1	3	f. on your own
		24. During resident professional military education you participated in battle studies:
66	118	a. more than twice a year
19	6	b. twice a year
7	7	c. once a year
3	0	d. less than once a year
5	0	e. never
		25. During the battle studies did you render tactical or operational decisions:
57	86	a. No
41	45	b. Yes
		26. If yes to the previous question, please circle the training techniques that pertain:
32	35	a. a leader (facilitator) created a tactical/operational scenario
18	25	b. you were provided with incomplete information
13	15	c. duress was present (i.e. time limit, changing situations, etc.)
31	34	d. a decision was required
23	35	e. you had to justify your decision
28	28	f. the decision was critiqued
3	9	g. Other

CSC Responses	AWS Responses	Survey Questions -- GENERAL
		27. Rate the potential value for computer assisted war games at the individual user level:
46	40	a. high
35	42	b. medium
12	29	c. low
6	18	d. Other
		28. Rate your access to a computer at work:
65	67	a. high
21	44	b. medium
15	20	c. low
1	0	d. Other
		29. Rate your access to a computer at home.
84	115	a. high
8	4	b. medium
8	7	c. low
1	5	d. Other
		30. Rate how ably resident professional military education develops judgment:
48	73	a. good
46	48	b. fair
7	8	c. poor
1	2	d. Other
		31. Rate how ably resident professional military education imparts knowledge:
83	103	a. good
17	23	b. fair
1	4	c. poor
1	2	d. Other

CSC Responses	AWS Responses	Survey Questions -- GENERAL
		32. Rate how ably resident professional military education teaches risk assessment:
33	40	a. good
53	65	b. fair
16	21	c. poor
0	5	d. Other
		33. Rate how ably the operational forces (FMF) develop judgment:
80	83	a. good
17	42	b. fair
3	4	c. poor
1	3	d. Other
		34. Rate how ably the operational forces (FMF) impart knowledge:
62	74	a. good
29	44	b. fair
9	10	c. poor
2	4	d. Other
		35. Rate how ably the operational forces (FMF) teach risk assessment:
58	59	a. good
32	51	b. fair
11	18	c. poor
1	1	d. Other
		36. During training in the operational forces (FMF), rate the importance of managing uncertainty
67	82	a. high
26	29	b. medium
7	16	c. low
1	3	d. Other

CSC Responses	AWS Responses	Survey Questions -- GENERAL
		37. During training in the operational forces (FMF), rate the importance of making a timely decision:
85	105	a. high
9	18	b. medium
1	7	c. low
0	2	d. Other
		38. In your assessment, in war as opposed to training does the management of uncertainty become:
83	109	a. more important
8	10	b. less important
9	13	c. Other
		39. In your assessment, in war as opposed to training does making a timely decision become:
89	117	a. more important
3	2	b. less important
7	11	c. Other

¹ Carl Von Clausewitz, *On War* (Princeton, New Jersey: Princeton University Press, 1984), 75.

² Quote attributed to Hans von Seeckt.

³ The Basic School (TBS), *The Decision*, (Quantico, Virginia: TB5930497.001, TBS 249), Quote taken from a photocopy of a class given to Marines in 1993.

⁴ Definition from the Internet, (<http://www.dtic.mil/cgi>, 02/16/97, 10:41:13), decision.

⁵ Paraphrased and quoted from Captain John F. Schmitt, USMCR, "Observations on Decisionmaking In Battle," *Marine Corps Gazette*, (Quantico, Virginia: Marine Corps Association, Mar. 1988), 18.

⁶ Draft Marine Corps Doctrinal Publication (MCDP) 5, *Planning*, (Washington, DC.: Headquarters United States Marine Corps, 1996), 40.

⁷ Paraphrased from Draft MCDP 5, 40.

⁸ Paraphrased from a written study by Major John F. Antal, USA, *The Commander and His Staff The Dynamics of Rapid Decision-Making in Tactical Formations*, (Maj. Antal's paper was presented to the Military Society of the Marine Corps University during a Symposium on Combat Decision Making, 7-9 May 1993), 42-43.

⁹ Gary A. Klein, "Strategies of Decision Making," *Military Review*, (May 1989), 56.

¹⁰ Paraphrased from an article by Major Jose A. Picart, USA, "Expert Warfighters With Battlefield Vision," *Military Review*, (May 1991), 53-54.

¹¹ Clausewitz, 577.

¹² Klein, 61.

¹³ Klein, 59. In addition, as defined by Herbert Simon, "satisficing behavior" limits a search to the first acceptable alternative, and avoidance of uncertainty or risk through developing short-run feed back and corrective procedures. For more on this, read Graham T. Allison, *Essence of Decision Making: Explaining the Cuban Missile Crisis* (Boston: Little, Brown, 1971), 71-72.

¹⁴ Paraphrased from Klein, 58-59.

¹⁵ Paraphrased from Klein, 58-59.

¹⁶ The ten features and the seven claims concerning NDM were copied from a MMS paper (AY 1995-96) prepared by Major John A. Koenig, USMC. Furthermore these were derived from

an article written by Gary A. Klein, *Naturalistic Decision Making: Implications for Design*, (Wright Patterson AFB, OH:CSARIC,1993), 29.

¹⁷ Major Arthur J. Athens, USMC, *Unraveling the Mystery of Battlefield Coup d'oeil* (Fort Leavenworth, Kansas: Monograph from School of Advanced Military Studies, USA, C&GSC), 4.

¹⁸ Clausewitz, 578.

- ¹⁹ *The Oxford English Dictionary* (vol. 3, 2nd edition, 1989), 1046.
- ²⁰ Quote taken from Captain B. H. Liddell Hart as he describes the German General Heinz Guderian in the foreword of, *Panzer Leader* (Norwalk, Connecticut: The Easton Press, 1990), 15.
- ²¹ Paraphrased and quoted from an article written by Major J. W. Howard, Ph.D., Canadian Army, "Psychology of the Tactical Appreciation," *Canadian Defence Quarterly* (Vol XVII No.3, April 1939), 332-333.
- ²² Paraphrased Athens, 16.
- ²³ Raymond S. Nickerson, David N. Perkins, and Edward E. Smith, *The Teaching of Thinking* (Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers, 1985), 101.
- ²⁴ Paraphrased and quoted from Athens, 16-17.
- ²⁵ Samuel B. Griffith, ed. and trans., *Sun Tzu, The Art of War*, (New York: Oxford University Press, 1963), 134.
- ²⁶ Draft MCDP 5, 40-41.
- ²⁷ Draft MCDP 5, 12.
- ²⁸ Paraphrased from Sean D. Naylor, Times staff writer, *Sheehan: "Don't hollow out our military,"* (Navy Times: Marine Corps Edition, February 24, 1997), 21.
- ²⁹ Strauss and Howe, 278.
- ³⁰ Draft MCDPS, 21.
- ³¹ General John M. Shalikashvili, USA, Chairman of the Joint Chiefs of Staff, "Joint Vision 2010: Force of the Future," *Defense 96* (Alexandria, Virginia: Armed Forces Information Service, Issue 4), 6-21.
- ³² Paraphrased from General John J. Sheehan, USMC, Commander in Chief, United States Atlantic Command, and Supreme Allied Commander Atlantic, "Next Steps in Joint Force Integration," *Joint Force Quarterly* (Washington, DC: National Defense University), 41-47.
- ³³ Paraphrased and quoted from Dr. Russel H. S. Stolfi, "A Bias For Action: The German 7th Panzer Division in France & Russia 1940-1941," *Perspectives on Warfighting Number One* (Quantico, Virginia: Command and Staff College Foundation, 1991), 79-81.

³⁴ Paraphrased from Dr. Russel H. S. Stolfi, 79-81.

³⁵ "Operational Maneuver From The Sea: A Concept for the Projection of Naval Power Ashore," Marine Corps Gazette (Quantico, Virginia: Marine Corps Association, June 1996), A-6.

³⁶ Ideas in this paragraph gathered from "FMFM 1," *Warfighting* (United States Marine Corps, 1989), 68-70.

³⁷ Quote attributed to the highly respected educational researcher Benjamin S. Bloom regarding the main conclusion in his study of experts.

³⁸ Robert J. Trotter, "The Mystery of Mastery," *Psychology Today* (July, 1986), 32-38.

³⁹ Paraphrased from Robert J. Trotter, 32-38.

⁴⁰ Paraphrased from a paper written by Captain Michael F. McNamara, USMC, "Essential Elements of Information for Leaders Who Take Action on the Battlefield," *Symposium on Combat Decision Making* (Quantico, Virginia, 7-9 May 1993), 10.

⁴¹ Paraphrased from an article written by Major John F. Schmitt, USMCR, "How We Decide," *Marine Corps Gazette* (Quantico, Virginia: Marine Corps Association, October, 1995), 16-20.

⁴² Quote attributed to Colonel Anthony C. Zinni, "Combat Concepts" Discussion, Marine Corps University's Professional Military Education Conference, Quantico Virginia, July 1989.

⁴³ Picart, 52.

⁴⁴ "Operational Maneuver From The Sea: A Concept for the Projection of Naval Power Ashore," Marine Corps Gazette (Quantico, Virginia: Marine Corps Association, June 1996), A-6.

⁴⁵ The ideas in this paragraph are derived and quoted from the translation of Frederick Immanuel, *The Regimental War Game* (Kansas City: Hudson Press, 1907), 20-21. Translated by First Lieutenant Walter Krueger, USA, 1907.

⁴⁶ *The Regimental War Game*, 20-21.

⁴⁷ *The Regimental War Game*, 20-21.

⁴⁸ Paraphrased from the *National Military Strategy* (Washington, DC: US. Printing Office, 1995), 2-3.

- 49 Percentages figured from data complied in appendix A.
- 50 Based on question (4) found in appendix A.
- 51 Percentages figured from data complied in appendix A.
- 52 Based on question (29) found in appendix A.
- 53 The author assessed, assigned and tracked non-operational tasks for the 1st Marine Division from May 1995 to June 1996 as the Division's G-3 Training officer. In the course of that time the 1st Marine Division supported several hundred non-operational tasks.
- 54 Notes provided by Lieutenant Colonel T. B. Sward taken from a phone conversation with Brigadier General Zinni regarding decision making (Stuttgart, Germany: 910214)
- 55 Quote from Dr. Russel Stolfi, *Taking Action in War* (Dr. Stolfi's paper was presented to the Military Society of the Marine Corps University during a Symposium on Combat Decision Making, 7-9 May 1993), 11.
- 56 Quote from a translation of Part I of the German text, "*Truppenfuhrung*" (Troop Leading), (Translated on November 1, 1935, by Lieutenant Colonel F. W. Milburn), Paragraph 3.
- 57 Percentages figured from data complied in appendix A.
- 58 Paraphrased and quoted from Major Jose A. Picart, USA, "Expert Warfighters With Battlefield Vision," *Military Review* (May 1991), 55.
- 59 Draft MCDP 5, 9.
- 60 The following discussion on Education and Training Techniques was obtained from the Draft of the 1st Marine Division Training SOP and modified to pertain to operational level leader development. The technique of "Dilemma -Based Training" is attributed to Lieutenant Colonel T. B. Sward, currently serving as the Commanding Officer of 1st Light Armored Battalion, USMC.
- 61 Major John F. Antal, USA, 62.
- 62 These fundamentals are similar to how Major John F. Schmitt, USMCR, designs TDGs. He outlines how TDGs work in his article "The How To of Tactical Decision Games," *Designing TDGs: A Tactical Decision Games Workbook* (Quantico, Virginia: Marine Corps University, 1996), 6.
- 63 Orson Scott Card, *Ender 's Game* (New York: Tom Doherty Associates, 1977), 288.

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