

Brilliant Warrior



A Research Paper
Presented To

Air Force **2025**

by

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Disclaimer

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Introduction

If we should have to fight, we should be prepared to do so from the neck up, instead of from the neck down.

—Jimmy Doolittle

Centuries ago Confucius observed that to lead an uninstructed people to war is to throw them away.” Today, centuries later, there can be no doubt that professional military education (PME) is a critical complement to professional military training. To assert that education is more important than training, or that training is more important than education, is to engage in an argument ultimately without much merit. Fielding an untrained armed force would be as unconscionable or as stupid as fielding a trained one led by uneducated *or* untrained leaders. While all agree on the importance of both training and education to the armed forces of the future, there is plenty of room for debate on how much professional military education a warrior needs, the different forms it ought to take, and the timing and the impact of information technologies.

This article hopes to encourage, and even enliven, that debate.¹ One thing is not debatable: People are the most valuable and critical element in the armed forces. It is people who must fight and win our nation’s wars. Technology provides the tools for fighting, and *training* enables us to use those tools to their best advantage. The aim of professional military *education* is to leverage the most powerful factor in the war-fighting equation: the human mind. Our training institutions and the capabilities they provide are superior. Training has remained relevant and has repeatedly reengineered itself to take advantage of advances in information technology, simulation, and discoveries about how adults learn best. Training is challenging, experiential, and, in some ways, fun. PME, on the other hand, has not kept pace with the improvements in training, let alone the need.

Unless PME better prepares warriors for the demands of the future, even our best training may be wasted. Understanding the changes that need to be made in the future of PME requires first that we differentiate between professional military training and professional military education.²

Training and Education

Military training and education do not aim at providing jobs or adventures. They are necessary for success in warfare. Training creates competence in using the machines or tools required for current military tasks. It is about teaching others things we already know and about using things that operate mechanically, electrically, or more or less predictably. Education, on the other hand, aims at acquiring the right intellectual

constructs and learning the appropriate principles of selection so that the needed tools are available and the right ones can be selected and used to achieve a desired effect. It is about trying to learn whatever it is we do *not* know but that *we envision what we need to know* to survive and succeed. Said another way, training teaches the archer how to use the bow and arrow. Education insures that the archer not only knows how and when to use the bow—and always aims the right arrow at the right bullseye—but also immediately sees the value of gunpowder as an improvement and complement to archery. The test of training is demonstrated competence in environments that exist and are understood today. The test of education is success in different environments; those perhaps not fully understood today, and those that may exist in the future.

The Quest and the Questions

For the past several years, Air University has engaged in studies of the future. SPACECAST 2020 was followed by the current effort, **Air Force 2025**, which was directed by Gen Ronald R. Fogleman, the Air Force chief of staff. This study aims to understand the air and space capabilities our country will need in the future, the systems and technologies that might contribute to those capabilities, and the concepts of operations needed to employ new capabilities best. Closely related in objectives are the numerous studies and seminar wargames being sponsored by the Office of the Secretary of Defense which seek to understand the revolution in military affairs (RMA). Each of the services and the joint staff are looking into the future. The quest is to look ahead two or three decades to understand the future “operating environments” in which our armed forces might find themselves. The obvious initial questions that arise are “Which future?” and “What makes you think you’ve got it right?”

Alternate Futures

Moving into the future, my friend Carl Builder reminds me, is like driving into the fog.³ If one wants to see specific things in the fog, turning on the high beams only illuminates the fog more brightly. To see the shapes in the fog requires lowering your beams, peripheral vision, and the ability to see the relationships between the shapes, the road ahead, and the means of illumination. It also requires making implicit assumptions explicit and then challenging them. The first thing one “sees” using Builder’s image is that there is more than one future visible in the fog. These “alternate futures” are each different, internally consistent, and often equally plausible. Any one of them could become *the* future. Some are benign. Others are onerous. Taken together, these alternate futures bound the strategic planning space, help identify risks, and offer awareness of the different challenges and opportunities that *may* lie ahead. Alternate futures are descriptive, not predictive or normative. They are “planning stories” or “scenarios.” Aware of alternatives, planners can choose to reject or ignore any or all. The objective is to clarify the shapes in the fog to reduce surprise and, hence, risk for decision makers. After all, the decision maker might be *you*.

But how do we know we got it “precisely right” in these planning scenarios? Alternate futures aim not to be precisely right but merely plausible and approximately right. This position is preferable to stumbling blindly ahead, or tenaciously clinging to the present until it unexpectedly becomes a future for which we are ill-prepared. The process of generating alternate futures, while necessarily a creative process, is rigorous and methodical. Just as we know the past by inference, we gain insight into futures by the same process of inferential reasoning. We also know that competitive, for-profit businesses generate alternate futures at considerable expense and can show that profitability increases when planning looks far ahead. A business that fails to look ahead may miss a new market or lose market share. Armed forces that fail to look ahead can lose the nation.

We look ahead to avoid being surprised, and there are other methods of looking ahead besides alternative futures.⁴ Methodologies may vary, and some are better than others, but all have a common objective: to provide insights into tomorrow so that present behavior can prepare us to cope with future demands.⁵ Thus, the task is to look ahead, describe the operating environment, describe the coping skills this environment may demand, and then postulate a range of actions in the present likely to produce the desired results in the future.⁶

Unions and Intersections

We are beginning to learn some things common to all futures: simply put, the soldiers, sailors, airmen, and Marines of 2020 or 2025 must become as “brilliant” as the tools they might have at their disposal. For example, the Marines’ *Sea Dragon* and the Army’s mobile digitized *Force XXI*—or whatever those become en route to the far future—cannot be understood or prosecuted by any but thoroughly trained and exquisitely educated forces. Add to this the growing possibility that engagement in nontraditional military missions is likely to increase, and that the armed forces are not likely to increase in size, then one begins to see that the education and training challenges are immense. A few examples illuminate the challenge.

What should planners study to enable them to envision a strike with precision-guided munitions against 5,000 targets simultaneously to produce the desired strategic effects? What kind of education is required to prepare a future combatant to go directly from an embarkation point in the continental United States (CONUS) to link up with a friendly coalition force to fight a common adversary in less than 12 hours after leaving home? How, for example, does one “train” a Marine for firefighting in California one week and, the next month, expect him or her to survive a firefight of the more hostile kind in combat with a uniformed enemy?

Recognizing the magnitude of these kinds of challenges—and continuing the quest to keep PME vital begun by Rep Ike Skelton—the DOD’s Office of Net Assessment has

sponsored workshops and conferences focusing on the military training and PME challenges posed by the future and by the RMA. In the conference reports, summary essays, and commentaries, similar themes begin to emerge. Whatever the actual future, there are useful unions and intersections in the environment of all futures. Armed with this awareness, we can chart or propose the waypoints leading to the future.

The Environment

An examination of future studies indicates that the operating environment of the far future probably will have at least these five attributes important to those planning today's professional military education and training.⁷

First, humans will still fight, and fighting could occur from anywhere on the planet's surface up to and including cislunar space. Much will change between now and the far future, but it is foolhardy to expect human nature to change in one generation to the degree that there is no likelihood of organized conflict. Someone will always want the other guy's "stuff." The fights, when they occur, could occur in environments ranging from jungle to polar ice to city to the orbital heights. The fights could be with national armies, criminals, or irregulars. The state will not wither away, even though it may have more powerful competitors than what we have today.

Second, the US armed forces will have become smaller; capability will be more tightly integrated; and speed, precision, and the ability to operate effectively in ambiguous circumstances will become the treasured operational values. "Cost" will be as important a criterion as capability in organizing, training, and equipping this future force.⁸ A cadre of nearly transcendent professionals—but not *six-million dollar men* or *robocops*—will constitute the force. The services probably will not merge into one service, nor are we likely to create a space corps or an information corps. We will still need a means to develop experts in land warfare, naval warfare, and air and space warfare—including the information operations that cross-cut all those combat media. This force will work side-by-side with many contracted and interagency personnel. All members of this force of the future must understand their individual contributions to the whole and how the contributors are integrated to meet the objective. Knowing how to make "my part" of the force work right won't be good enough; I must know how "your part" works, too.

The gold standard for this force will be its ability to make rapid precision strikes, both physical and electronic-photonic, and operate effectively in situations that may have high ambiguity. Precision and engagement speed (strikes and restrikes) will compensate for smaller forces. Events will unfold so rapidly that time and timing become critical. The ability to act over great distances, to achieve desired strategic effects rapidly with a minimum amount of damage (including

damage to the ecosystem) or casualties, and to withdraw or terminate quickly may well deter many potential adversaries.

Third, *there will be swarms of interactive smart machines*. Builder called the information technology explosion “the key disturber” of our time.⁹ “Brilliant” systems—with many of them being quite small—are the inevitable consequence of the explosion in computing power and information technologies. A lecturer at Air University suggested that there could be microchips in just about everything before the middle of the next century. These little microchips would make “dumb” things smarter. When the microchips communicate with a central processing unit, they will constitute a “smart” network. When smart networks communicate, almost brain-like systems will emerge. Today, retired Adm William Owens and others describe this phenomenon as the coming “system of systems.” In 30 years so much “intelligence” will have been embedded in everything, with so many of these things interacting with humans, that we are more likely to describe the armed forces of the future as an “organism of organisms.”

Fourth, *coalitions will be the norm*. Technology and a common dedication to improving human quality of life will combine effectively to shrink the planet and lead to a greater harmonization of interests, without a loss of cultural or national identity. The electronic internetting of economies, the tremendous increase in routine leisure and business travel, and the ease of person-to-person contacts will facilitate greater cooperation. Threats to the interests of one of our global partners will imperil us and other global partners more than they do today, and we will act in concert with our partners. Military-to-military exchanges, coalition training exercises, and actual operations will link the allied warriors of the planet and promote a kindred spirit among them. We must and will preserve the ability to act unilaterally, but—like it or not—coalition operations will be the norm.

Fifth, *tomorrow’s subordinates and leaders will be different from today’s*. While this conclusion may have the ring of the authentically unremarkable to it, we tend to forget that people in the distant future will not be exactly the same as 1995 people propelled unchanged into the future. The same genetic material will be influenced by a vastly different environment. Some analysts observe that often ignored social changes may be the driving force of all change, including changes in technology. Thus, we need to remain aware that the “led” of the far future will be conditioned by events and forces en route to the future that we cannot foresee today. By the first part of the next century, they may appear as different from our perspective as the leaders and led of 1965 seem when we recall them today. While you and I may appreciate other music, tomorrow’s *leaders* seem to prefer MTV, *Hootie and the Blowfish*, and *Snoop Doggie Dogg*. We can only imagine what *their* subordinates will favor.

Our leaders will change, too. By 2025 we will have had nearly half a century of jointness in the US armed forces and the speed bumps of today will have been flattened.

The demographic composition of the Congress also will be different. Today, fewer than 40 percent of the Congress have served in the armed forces. Thirty years from now the percentage may be much smaller. An important element of continuity is that our armed forces will remain respectful of the president, beholden to the law, including all the laws made by different Congresses between now and the far future, and will remain under tight civilian control.

The Output

Given the five likely attributes of the future environment, to complete our model we must next examine the desired output as a prelude to describing the input and the military education and training contribution. To cope and succeed in a world with the attributes postulated, what kinds of skills and behaviors are required? In the most compressed terms possible, and given the attributes of the future environment, education must help military professionals *at least* acquire this kind of knowledge, learn these skills, and have these behaviors:

1. *A constantly improving understanding of human motivation and the interpersonal skills necessary to achieve cooperation to attain the desired objective or achieve the desired effect.* In other words, the essence of leadership may be the ability to act with an understanding of what makes people tick. Harry S. Truman defined leadership as “making people do what they don’t want to do and like it.” Understanding why humans of different backgrounds and cultures (or services) behave the way they do in different circumstances is integral to understanding the sources and nature of human cooperation, friction, and conflict. To prepare military professionals for success in the far future, they must learn more about leadership and human behavior—their own, their subordinates’, and their adversaries’.

2. *A strong commitment to right conduct that almost invariably results in right behavior.* Note the qualifier “almost.” Because human nature will not change much, and because freedom to choose is important, there *will be* misconduct and mistakes in spite of our best efforts to prevent them. In 30 years our democracy will be more mature and will have evolved, but it will be based, as it always has been, on our passion for the goodness of individual liberty and our belief that people ought to be respectful of the law. As public servants in a society that cherishes its free press, we will be scrutinized more closely than they are today. A military that loses public support may be in more trouble than one which loses a battle. Education can provide the confident assurance of virtue, right conduct, and the fidelity to core values. Professional military education must impart the values that build character.

3. *The eagerness to discover new tools, the ability to think creatively of new uses for existing tools, the initiative to innovate, and the ability to know and willingness to take acceptable risks.* The tools and machines available for everything, including fighting, could be as numerous in the far future as they are marvelous.¹⁰ Gazing back to

1965 and comparing the technologies available then to those available today, space systems (except for spacelift), stealth, and sensor improvements stand out initially as military innovations. The powerful information technologies and the advances in biochemistry and medicine were developed by the private sector. Even so, the armed forces of 1996-2025 must have the knowledge and the incentives to identify and select those emerging developments that can enable dominant military capability: the basic sciences of chemistry and physics; discoveries and innovations in pharmaceuticals, electronics, air and space industry; and information technology. All of us need to know more about space and space operations because our quality of life and success in battle will depend increasingly on them.

Certainly, the areas of technical competence that *training* must provide are more numerous, but education aims at big constructs acquired in more complicated ways. Knowing the environment and the desired output, what then is the input?

The Input

The president of the United States in 2025 probably is in high school today. The chairman of the Joint Chiefs of Staff and the chiefs of staff of America's services of the far future are cadets, midshipmen, lieutenants, or captains today. The environment and experiences that will have formed them will be significantly different from the experiences that formed today's warriors. Thus, we begin with a different input: somewhat different people with a somewhat different orientation.

The Thirteenth Generation

The differences in this generation are significant.¹¹ The present generation is the first generation to have grown up with television and matured with computers, video games, and portable communications devices. Most are "wired," and "the net" is just another "really cool" place. They are fitter and healthier than we are, and their offspring likely will be even healthier. They are destined to live longer. They "recycle" because it's obvious to them—"like get a *clue*, dad"—that humans *ought to* care for the planet and the environment. They have experienced more (and earlier) than past generations. They want "more" and are willing to take risks to get more. They are enthusiastic and impatient. They demand stimulation, excitement, and speed in their lives. Many are in family situations with a single parent, multiple step-parents, or absentee parents. They are loyal fans of people and teams and brand names. They expect and demand diversity. They are choosy, and some are private and protective of their "stuff" and their "space." Most are good people, even considering that some are good people in bad circumstances. They will come to us because we offer them challenges and responsibilities they cannot get elsewhere.¹² Thus, the question becomes, "What must we do in PME today and tomorrow to educate folks *like these*—the military leaders of the next century?"

One answer is to ignore their differences and assert that we will force them into the cookie-cutter of our traditional professional military education system; an environment, John Warden once remarked, “Socrates would be comfortable in.” But remember, they will come to our hallowed halls already trained and will expect no less challenge in education than they experienced in training and, for that matter, “at home.” The traditional approach is not likely to work. Rather, PME must come at the right times, offer them the right set of experiences, help them to navigate to the right information in the sea of available information, encourage them to use the nearly risk-free laboratory of the PME university to experiment and innovate, use technology to place them in unusual circumstances and environments, and guide them to make connections and arrive at conclusions they can test for themselves. If we can *envision* alternate futures, we can use technology to create them as virtual realities. If they cannot get all the genuine experiences we believe they will need to survive and succeed, we must strive to give them many *near-genuine* ones. If we can use technology to help them learn to operate in the virtual reality of these alternate futures, we help to prepare them to cope with the demands of whatever “the” future will offer. *The role of the professional military educator in the future is more important, not less important.* Those of us responsible for PME must, in short, prepare each of our charges to be a “Brilliant Warrior.”

Brilliant does not mean “an IQ of over 140” or “SAT scores of at least 1,500.” It means that we have taken people *already committed* to the warrior profession and must train and educated them in such a way that by 2025, as compared to today, they will be brilliant—smart, adept, agile, savvy—professional warriors. Take away the gizmos of Robert Heinlein’s *Starship Trooper* and use that image to envision the best in tomorrow’s warriors. They should have all the attitudes and behaviors that allow them to survive, succeed, and lead others in whatever future we find ourselves. They must be lifelong learners, thinkers, and prudent risk-takers. Our gift to them is a PME system that forces them to think, encourages them to learn how to learn, and gives them the confidence that they will know what to do in new operating environments because we’ve given them the opportunity to *experience* these alternate environments. Their gift to us, in return, is that we can have high confidence that they know how to behave and will not let us down. They are, or will be, the champions of the warrior profession, the guardians of democracy, and the protectors of *our* future.

Recall I asserted that there will be fewer warriors in the future and that cost will rival capability as a criterion for organizing, training, and equipping the force. As alternative approaches to PME are evaluated, the two suggested criteria are (1) effectiveness: the desired knowledge is acquired and the right behavior results; and (2) cost: the highest value and best return on investment results.¹³ Both criteria must be applied with an awareness of the changes that will occur *naturally* between now and the far future.¹⁴ The debate has begun; it is now time to enliven it.

Forming Brilliant Warriors

The alternatives that might meet the specified knowledge and behavioral objectives are many. Choosing from among the alternatives will define *specific* characteristics of a PME system that must *also* choose its *general* characteristics. The process of choosing is itself difficult: today there are public laws to satisfy; the Joint Staff is involved; and the services, training commands, and using commands are all participants in the process. Tomorrow, future strategy reviews, force restructure, roles and missions commissions, and new public laws also can be expected to affect choices.

General Characteristics of a Future PME System

As the services become more integrated over time and the size of the defense establishment shrinks, efforts will be made to reduce infrastructure costs and investment. Today, each of the services has both a command and staff college *and* a war college. Tomorrow, the services may be represented by robust “departments” on one campus—a move the British are making. Another alternative, of course, would be to combine what are today intermediate- and senior-level schools into one school for each of the services, and transform the National Defense University into general and flag officer PME.¹⁵ Today, a warrior is likely to attend resident PME both at the intermediate level *and* at the senior level, devoting 20 or more months to in-residence education. Tomorrow, resident PME might be for periods of much shorter duration. Today, selection for resident PME is made by the service. Tomorrow, joint selection boards may identify officers to attend resident PME.

Today, PME is technology-poor. Tomorrow, and if the private sector is encouraged, resident PME could have powerful technologies. These technologies would allow creation of different virtual realities and use resident PME as the crucible for learning experiences that may not be duplicated in or provided to the field.¹⁶ For example, we may wish the warrior to experience operating in a known environment, such as Somalia or Bosnia. But we may also want to provide the warrior “the experience” of adapting to a less certain or future environment.

Today, PME is discontinuous and episodic. Tomorrow, resident and nonresident education may see warriors *continuously* educating themselves in a deliberate lifelong learning system. Today, civilians on the faculty of PME institutions may have “tenure.” Tomorrow, they may be contract employees, visiting scholars from civilian institutions, and former warriors who have “been there and done that . . . well.”¹⁷ Today, much of the core of most PME curricula is built around a study of Clausewitz or Mahan and the great campaigns of history. Tomorrow may see curricula built around providing stressful experiences in virtually real leadership situations and in employing joint doctrine and combined arms in coalition war games, along with ethics education, and regional studies. Envisioning, creating, and teaching such a curriculum requires educators of impressive competence.

All of these—and more—choices and challenges, and the debates that will most assuredly attend them, await us. And “us” is all of us: the Congress, special panels and commissions, the Office of the Secretary of Defense, the Joint Staff, the commanders in chief, the services, training and education commands, and the troops. My guess is that those of us responsible for providing PME will remember the tongue-in-cheek challenge of General Rokke’s *Rule Number 5*: “As academies, we will advise others to change, but will likely ensure that revolutionary change takes place most slowly within our own organization.”¹⁸ This will not do. If we do not adapt, innovate, and lead-turn the need, then we are without merit and not fit to lead, let alone educate.

Specific Characteristics of a Future PME System

Even as the choices that determine the general characteristics of a system intending to produce Brilliant Warriors are being made, more specific choices must be made also. The specific elements chosen must, like the general ones, meet some criteria. I proposed effectiveness and cost. The aim is to bring the powerful learning *experiences* of life, leadership, and warfare into PME. It is experience that may remain the best teacher. As Lao Tze argued centuries ago, “If you tell me, I’ll listen. If you show me, I’ll see. If I experience it, I’ll learn.”¹⁹

The function of PME is to produce effective warriors who behave properly. The form that PME takes is determined by its function, by the environment, and by the characteristics of the people to be educated. Given the behavioral objectives postulated, and recognizing that the specific characteristics of a future PME system will be affected by the choices influencing the general shape of PME, what are the alternatives? I frame these alternatives as questions, and the questions are not intended to be either mutually exclusive or exhaustive. The conclusions reached—my answers—are hypotheses for testing and debate. They include the following:

• **A constantly improving understanding of human motivation and the interpersonal skills necessary to achieve cooperation to attain the desired objective or achieve the desired effect.**

- More psychology, anthropology, or social science?
- Interactive learning with artificial intelligence as a tutor or more classroom teachers?
- Virtual reality systems that allow the student to live in future environments?
- More role-playing, case studies, biography?
- Increased international officer and civilian enrollment?
- More theoretical models to study and evaluate?
- More “virtual” travel or military-to-military exchanges?
- Studies of mathematics and chaos theory?
- Multidisciplinary teaching teams?

—More history or less?

Brilliant Warrior, as I envision it, requires that distance learning keep the force in continuous PME.²⁰ Yet, even distance learning will be tiered: all learners receive a customized curriculum, and the more eager students receive a more challenging curriculum than the others. While some warriors are nonetheless in PME, they may remain at the “maintenance” level their entire career. Only the top percentage of a year group--those who have demonstrated the potential for future command--will attend resident PME. The foregone conclusions should *not* be that resident PME be nearly one year long, nor that it must occur at traditional sites. This resident PME of the future could be a series of shorter resident-learning opportunities. These learning opportunities aim to provide those experiences that distance learning cannot provide. Chief among these is experiencing living and performing in the stressful circumstances of alternate futures. Thus, resident PME must begin to provide a more experiential curriculum that bears on the problems of conflict, human relations, and military leadership. Knowledge is about making connections and choices, so the approach taken is necessarily multi-disciplinary. Likewise, the course must be multicultural. The participation of international officers and civilians must increase. One series of in-resident learning opportunities might focus air officers on experiencing joint and coalition air and space operations in an alternate future environment. A different series tailored for naval officers would allow them to experience future operations in their operational medium. These PME resident learning opportunities might come several times a year between the 10- and 15-year points—some of them intentionally on short notice—and prepare the warriors for initial large command and senior staff responsibilities. Those exceptionally well qualified, as indicated by selection for general or flag rank, would go on to the National Defense University of the future at just past the 20-year point. These concerns are listed below:

• **A strong commitment to right conduct that almost invariably results in right behavior.**

- More ethics education or less?
- Deeper study into the American system of government?
- A curriculum that requires making difficult personal resource allocation choices?
- Placing students in alternate future environments with high ambiguity and uncertainty?
- More health and fitness activities or less?
- More seminars or fewer seminars or no seminars?
- More or less reading and writing?
- More personal mentoring or less?

Professor Dick Kohn of the University of North Carolina and others express concerns about civil-military relations that demand attention.²¹ For America to maintain its leadership position, it must have leaders who understand the American ideal, the way

in which the government and its decision-making processes work, and the Constitution. These leaders must also be educated in the service's core values and in ethics. It is on these pillars that distance learning in the five- to ten-year time frame ought to be built, since civilian educational institutions may not emphasize them to the degree *required* for professional warriors. In all cases, resident education needs to broaden awareness of the challenges that may be encountered in the future, and technology could allow the warriors to experience them by performing in virtually real futuristic environments. These concerns include the following:

• **The eagerness to discover new tools, the ability to think creatively of new uses for existing tools, the initiative to innovate, and the ability to know and willingness to take acceptable risks.**

- A wargame-centered curriculum?
- A research-centered curriculum?
- A book-centered curriculum?
- More studies on the relationships between technology and war or less?
- Formal education and experience in creative thinking?
- Formal education in logic, rhetoric, and critical thinking?
- A mandated curriculum or a self-selected curriculum?
- Opportunities to experiment with and fight different force structures?
- Formal education in operations research and operations analysis?
- More emphasis on the sources of conflict and change or less?

Brilliant Warriors must be critical thinkers. Professor I. B. Holley of Duke University identifies the lack of education in critical thinking as a serious shortfall in today's PME curricula. Critical thinking skills are enhanced by a curriculum that emphasizes research. The French currently use a research-centered model in their joint senior PME today. Research into the past may be less germane to the Brilliant Warrior than disciplined and creative thinking about the future, but the value of studying the past is that it warns us about repeating mistakes in the future. More and better wargames (including analytical wargames) need to bolster the resident curriculum to improve critical and creative thinking. Studies of joint forces and capabilities—of the “here's how Joint Operation Planning and Execution System works” or “a battalion looks like this” or “an F-15E does that” variety—which are not “educational,” do not require critical thinking, and today clutter the curricula of even senior PME, would fill the 10-to-15-year interval of continuous distance learning. Readings and interactive discussions in strategy and history, using advanced distance learning, would provide the basic discernment necessary to be a warrior leading warriors. Performance in distance learning courses should be a factor in selection for resident PME.

The illustration below summarizes features of the Brilliant Warrior model.

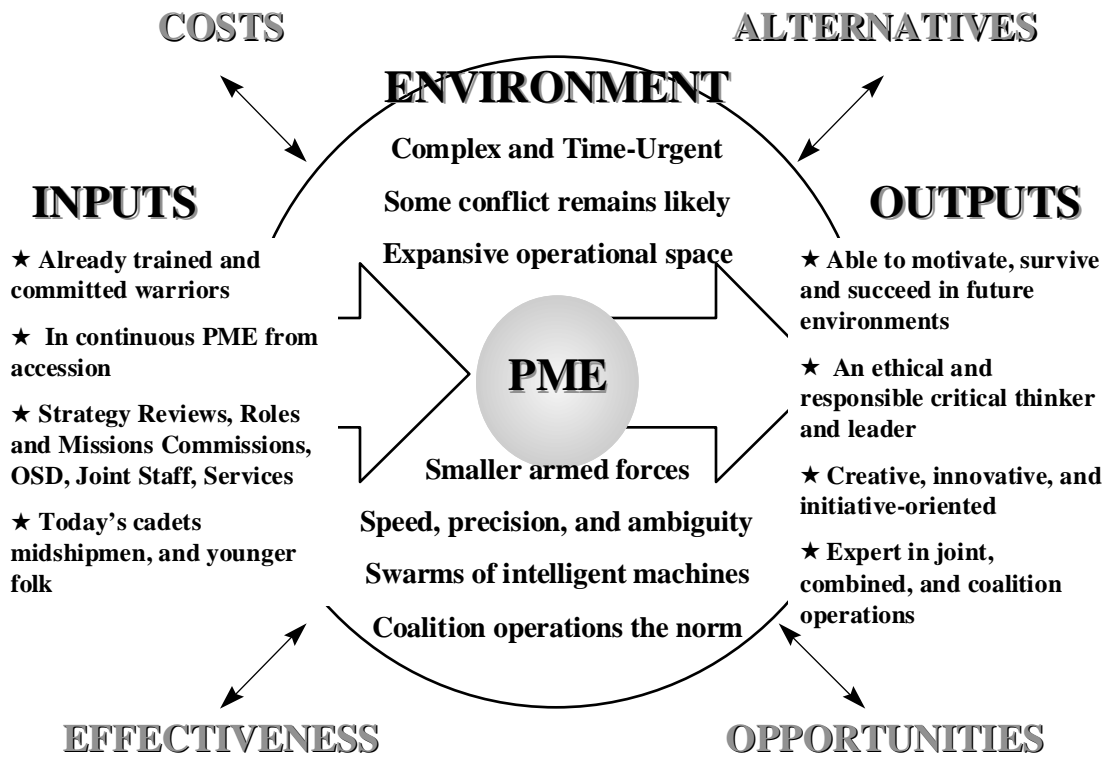


Figure 1. The Brilliant Warrior Model

Choosing Wisely

Military training and PME are critical components of the national security strategy. Military training and PME thus intersect the interests of three of our most conservative institutions: the military, education, and the government. These institutions are not as averse to change as they are slow to change and quick to resist unnecessary change. We have brilliant educators to help meet the goal of producing Brilliant Warriors for the future, but what we lack is vision—where we want PME to go and what we want PME to be. PME classrooms may be wired and students may be issued laptops, but—without vision—these may be little more than unavoidable, unimaginative, and interesting improvements.

There is no time like the present to begin thinking and debating the changes necessary to keep PME relevant and valuable. The future, whatever it proves to be, will be our measure. Unless we act in the present, thinking about the future becomes so much intellectual arm-waving. We cannot expect to have Brilliant Warriors to face the future unless we begin preparing today. This essay suggested some ways, but these are not the

only ways and they are not *all* the ways.²² We are not free to dodge the obligation to choose: PME *will* change. That being so, we should choose wisely.

Notes

¹ The views expressed are ideas. They are not necessarily the officially held views of the Air Force, the Air Education and Training Command, or Air University.

² A definition of training provided by I. B. Holley is “to develop proficiency by instruction and practice or drill; training equips one to do repetitive tasks skillfully.” He defines professional military education as a way “to cultivate the mind to make sound decisions in unique situations; education equips one to cope with uncertainty and confusion.” I. B. Holley to Lt Gen Jay W. Kelley, 6 February 1996.

³ Carl Builder, “Guns or Butter: The Twilight of a Tradeoff?” (May 1994), a presentation to the USAF Air University National Security Forum, Maxwell AFB, Ala. Used with permission.

⁴ The National Intelligence Estimates combine linear trends and extrapolations with human judgment. The “footnotes” of formal disagreement provide alternatives for consideration. Some analysts look at future “trends” to predict when specific changes will occur and their probability of occurrence. Alvin and Heidi Toffler shun trends in favor of making judgments about the “second order effects” of changes that combine. *WIRED* magazine published an entire “scenario” issue dedicated to alternate futures. *Scientific American* dedicated its 150th Anniversary issue to an exploration of key technologies in the twenty-first century. Most recently, the Air Force Scientific Advisory Board published an insightful glimpse into the future in *New World Vistas*. And there are useful books—by Adm William Owens, Paul Kennedy, Peter Schwartz, and John Peterson—that aim to illuminate the world of tomorrow.

⁵ The best way to anticipate the future may be to work to shape it. By generating alternate futures the organization is better prepared to avoid less desirable ones and pursue a better one.

⁶ Richard C. Chilcoat, “The ‘Fourth’ Army War College: Preparing Strategic Leaders for the Next Century,” *Parameters* (Winter 1995-96), 3-17. While there is plenty of information available for strategic planners, much of it needs further analysis and reflection before it can inform decision making in specific areas. Our concern here is military education and training. Maj Gen Dick Chilcoat’s essay does this by using the operating environment of the future and the future Army described in *Force XXI* to closely link the Army’s premier professional military education school and its curriculum to tomorrow’s demands.

⁷ These are what I derive from analysis and synthesis, and limited space does not allow me to engage in limitless justification of this list. Others add other technical and operational attributes: coherent and simultaneous operations, asymmetry, the presence of cruise missiles or weapons of mass destruction, information dominance, and others. Rather than categorize the attributes so narrowly, I have described them in broader terms.

⁸ Dr Gene McCall, et.al., *New World Vistas: Air and Space Power for the 21st Century* (Summary Volume), December 1995, 4-5.

⁹ Builder.

¹⁰ If the tools are “numerous,” the objects themselves could be small because of advances in nano-technology and micro-electromechanical machines. I don’t envision an armed force larger than today’s force.

¹¹ Col Donald R. Selvage, United States Marine Corps (USMC), “Recruiting the Corps of the 21st Century,” an address presented to the USMC Reserve Officers Association, Chicago, Ill., 16 September 1995. See also Office of the Assistant Secretary of Defense for Force Management, “1994 Youth Attitude Tracking Study.”

¹² The latest USMC recruiting advertisement video offers potential recruits dangerous tests, trials by fire, the chance to combat evil in the form of video-game-like, computer-generated image of an enemy. If the candidate passes these tests, he or she is offered the reward of permanent transformation. It is an approach specifically designed to appeal to the target market and my guess is that it will work.

¹³ The precise delineation of cost, value, and return on investment as metrics remains difficult. Because of the difficulty, PME largely has evaded the “green eyeshade” folk. The ultimate metric is victory in our nation’s wars. Thus, we cannot hold up the pre-WWII German *Kriegsakademie* as a model on the one hand and use the metric of victory on the other. Future cost computations might include such variables as the cost of time away from primary duties, relocation and travel costs, and the overall costs of the PME system

(infrastructure, personnel, recurring expenses). Value can be calculated by determining performance at different costs. Return on investment might be the amount of time served in primary duties compared to the amount of time in resident PME.

¹⁴ For example, for us to specify that “PME needs more information technology” is not particularly insightful. PME cannot avoid acquiring more information technology because one cannot forecast an environment where improvements in information technology do not occur naturally. The real issue is to specify the information technologies *for education* that keep pace with need and with the information technologies used in training.

¹⁵ This alternative would send “operators” to the National War College and “acquisition executives” to the Industrial College of the Armed Forces as an alternative to what is today *Capstone*.

¹⁶ Nicholas Negroponte, *Being Digital* (New York: Vintage Books, 1995), 116-28.

¹⁷ Consider that two forces at work are (1) further reductions in the size of the armed forces and (2) increased life expectancies for Americans. Given those two factors, one can easily imagine a large pool of retired and highly qualified commissioned and noncommissioned officers—already receiving some level of retirement income—willing to offer their services as PME faculty members at competitive costs.

¹⁸ *Conference Report: Professional Military Education and the Emerging Revolution in Military Affairs* (SAIC Document Number 95-6956), 22-23 May 1995. Rokke’s Rules: (1) Projecting the future nature of war is more akin to a floating craps game than an exact science; (2) future PME will need to participate in student learning from dust to dust; (3) the major drivers of RMA currently are outside the military; (4) the path to RMA may run through some, all, or none of our respective institutions; (5) as academies, we will advise others to change, but will likely ensure that revolutionary change takes place most slowly within our own organization; (6) Yamamoto and Rommel did as much for the aircraft carrier and combined arms warfare in American military as 20 years of effort at Newport and Leavenworth; (7) to a greater extent than in the past, the RMA train is fueled by engineers and basic scientists ... as apart from social scientists and humanities folks; (8) the information component of the RMA is inherently joint, interdepartmental, and transnational; (9) ultimately, NDU’s role in RMA ... relative to service counterparts ... will be proportional to the extent that planes, ships, and tanks are marginalized; (10) PME jointness, like good Aquavit, is best in moderation and when accompanied by Army, Navy, Marine and Air Force ‘chasers.’ Used with General Rokke’s permission.

¹⁹ Cited in *SPACECAST 2020*, “Professional Military Education (PME) in 2020,” L-26.

²⁰ The Air Force chief of staff recently mandated a forcewide “mentoring” program. The result will be that the existing gaps in educational experiences will be filled, and every officer in the Air Force will be in continuous education.

²¹ Richard H. Kohn, “Out of Control: The Crisis in Civil-Military Relations,” *The National Interest* (Spring 1994), 3-17.

²² Additional motivation ought to come from awareness that the United States is not the only nation aiming to improve its professional military educational technology. See Wang Jianghuai, “Warfare Simulation: Research and Application in High-Tech Warfare,” 1 December 1995, in Foreign Broadcast Information Service-CHI-96-018, 26 January 1996, 20-21.