EXPLORING THE HEART OF LOGISTICS

Functional Experts for Campaign Planning: How Does the Air Force Develop Logisticians to Satisfy the Operational Level of War?

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Introduction

The impending requirements of the 21st century's emerging geostrategic landscape mandate a revolution in how Air Force logisticians are developed and educated. This education must create a comprehensive vision to deliberately *grow* Air Force logisticians with the necessary functional expertise to provide critical, time-sensitive advice to combatant commanders (COCOM) and commanders Air Force forces (COMAFFOR) as well as prepare combat forces (organize, train, and equip) to carry out the commander's intent. The United States military entered the 21st century prepared to conduct force-on-force campaigns against nation states; however, shortly after the events on September 11, 2001, the military recognized the need to change its organization and culture to meet new challenges in the world. The former secretary of defense, Donald Rumsfeld, highlighted the need for greater flexibility and agility.

> We entered the century really arranged to fight big armies, big navies, and big air forces, and not to fight the shadowy terrorists and terrorist networks that operate with the support and assistance of terrorist states. And that's why we are so focused on transforming the department and the Armed Services. To win the Global War on Terror, the Armed Forces simply have to be more flexible, more agile, so that our forces can respond more quickly.[1]

In 2004, the Joint Chiefs of Staff (JCS) issued a revamped Focused Logistics Campaign Plan. In this plan, the JCS Director of Logistics clearly states that future Joint warfighting will place extraordinary demands on our abilities to execute superior logistics support decisions.[2] The demands referred to in this plan go beyond just information collection and dissemination, but include the decisionmaker as well. The decisionmaker must possess the functional expertise to quickly understand the information and provide leadership and advice to either his or her staff or senior leadership. Accordingly, Air Force logisticians must transform their education and training paradigms to ensure they have the correct expertise to rapidly deploy and sustain forces for the COCOMs and COMAFFORs.

According to Joint Publication 3-0, *Doctrine for Joint Operations*, the operational level of war is defined as:

> The level of war at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives within theaters or other operational areas. Activities at this level link tactics and strategy by establishing operational objectives needed to achieve the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events.[3]

The operational level of war is a complex, fast paced environment in which the initial plans and guidance for subordinate units to execute are provided. An initial plan may developed by generalists, but eventually those generalists must become subject matter experts capable of planning and executing logistic support for theater-level operations. Logistics expertise, like operations, medical, and communications, is paramount to ensuring a plan's success. Logisticians analyze the deployability and sustainability of any campaign plan. By having well trained and educated logistics subject matter experts on staff, the COCOM and Air Force Forces (AFFOR) staff can expedite decisionmaking, possibly ahead of the enemy's decisionmaking cycle, and compress planning time lines.

The Air Force logistics community has approximately 383 field grade officer (FGO) positions assigned to the various geographic COCOM, functional COCOM, and AFFOR staffs.[4] This represents approximately 51 percent of logistics FGO positions across the Air Force. Thus, a majority of Air Force logistics FGOs and some company grade officers (CGO) will find themselves working on a COCOM or AFFOR staff conducting crisis action and contingency operations planning. Like other career field specialties, these officers will be valued for the expertise in logistics; therefore, the Air Force must develop an education strategy to deliberately develop logisticians with the necessary functional skills to provide timely, accurate advice to combatant and AFFOR commanders.

Operations

Issue Background and Significance

What is logistics? Officers are told it is important, but not exactly why. It is often discussed in professional military education, but not in great detail. It seems to encompass all things that are not operational or medical. Martin van Creveld provides a succinct definition. He stated, that after the COCOM or AFFOR identify the center of gravity, "the feeding into it of men and material is a question of bases, lines of communication, transport, and organization—in a word, logistics."[5] Joint Publication 4.0, *Doctrine for Logistics Support for Joint Operations*, defined logistics in this way.

> The science of logistics concerns integration of strategic, operational, and tactical sustainment efforts while scheduling the mobilization and deployment of units, personnel, equipment, and supplies in support of the employment concept of the geographic combatant commander. The relative combat power that military forces can bring to bear against an enemy is enabled by a nation's capability to plan for, gain access to, and deliver forces and material to the required points of application across the range of military operations.[6]

Logistics is the *magic behind the curtain* that deploys, receives, integrates, sustains, and redeploys Air Force units to successfully execute COCOM and AFFOR objectives around the globe.

In 2002, the Air Force combined the transportation, supply, and logistics plans Air Force specialty codes (AFSC) into the logistics readiness officer (LRO) AFSC.[7] For the purposes of this article, the term Air Force logistician refers to the former Air Force supply, transportation, and logistics plans career fields. The terms Air Force logistician and LRO may be used interchangeability, but they both refer to core Air Force logistics officers. It does not include aircraft maintenance or munitions. The Air Force's vision was to create a logistician that mirrored its sister Service counterpart who could perform more effectively in the Joint environment. Field grade officers in the former career fields were *grandfathered* and immediately became fully qualified LROs. Former transportation, supply, and logistics plans company grade officers (CGO) who had two years experience in their current AFSC and who had successfully graduated from their technical training were classified as *round-out* officers. These officers were required to complete one rotational assignment in something other than their *core* specialty and computer-based training courses in the other *noncore* areas.

Article Acronyms

ACS – Agile Combat Support
AFFOR – Air Force Forces
AFPC – Air Force Personnel Center
AFSC – Air Force Specialty Code
ALMC – Army Logistics Management College
AQD – Additional Qualification Designator
CFETP – Career Field Education Training Plan
CGO – Company Grade Officer
COCOM – Combatant Commanders
COMAFFOR – Commander Air Force Forces
CYOS – Commissioned Years of Service
FGO – Field Grade Officer
GWOT – Global War on Terror
ILO – In Lieu Of
JCS – Joint Chiefs of Staff
LOOP – Logistics Officer Orientation Program
LREC – Logistics Readiness Expeditionary Course
LRO – Logistics Readiness Officer
LRS – Logistics Readiness Squadron
O-6 – Colonel Designation
OEF – Operation Enduring Freedom
OIF – Operation Iraqi Freedom
OJT – On-the-Job Training
ONE – Operation Noble Eagle
OSD – Office of the Secretary of Defense
SEI – Special Experience Identifier
SOC – Support Operations Course
US – United States

In the midst of this transformation, the Air Force was conducting Operation Enduring Freedom (OEF), followed very quickly by Operation Iraqi Freedom (OIF) in 2003. Thus, LROs found themselves faced with the challenges of operating effectively in the Global War on Terror (GWOT), while learning new disciplines and leading new combined organizations. Despite these challenges, the LRO career field must find a way to strike a balance between the requirements to have senior leaders with a broad understanding of logistics with the requirement to retain some number of leaders with depth in a single core competency.

Jomini states, "Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act; logistics brings the troops to that point."[8] In order to determine the overall effectiveness of logistics in military operations and the performance of LROs, the author reviewed several lessons learned documented from recent operations. An overarching theme of all lessons learned documents was that while recent operations such as Operation Allied Force, Operation Noble Eagle (ONE), OEF, and OIF were overwhelming combat successes, logistics performances appeared to fall behind other functional successes. As far back as 1999, Air Combat Command's Agile Combat Support (ACS) concept paper denotes the need for logistics support personnel training requirements for multiple related (cross functional) skills as well as advanced education and specialty training requirements to maximize effective ACS implementation.[9] As part of the lessons learned for OIF, the Office of Secretary of Defense (OSD) identified fundamental challenges for logistics support to the warfighter. Information and processes remain stovepiped, in-theater planning and resources were insufficient, and the lack of flexibility and responsiveness of the logistics chain required numerous ad hoc solutions for basic needs.[10] Lack of training in Joint interoperability is evident throughout the lessons learned. When discussing the development of a true Joint logistics staff capability, OSD stated:

> Leadership must recognize that the growth and development of *Joint logisticians* who can operate and lead effectively in the theater environment will take time and effort, potentially altering established career progression plans.[11]

Furthermore, the Government Accountability Office on logistics effectiveness during OIF states, "Military personnel were not adequately trained in various logistics functions, such as…operating theater logistics centers."[12]

Beyond the execution phase of operations, most lessons learned identified training and education as reasons for shortcomings in support. Most reports discounted the phrase "train as we fight" and identify the need for the Air Force and other Services to formalize their Joint training and education programs. Indeed, the Air Force's installations and logistics lessons learned final capstone report on ONE and OEF emphasizes the need for the Air Force to establish regular training within the Joint environment, training with special operations forces, and exercises and training for liaison officers for placement in Joint and coalition critical command and control nodes. The report further states that:

> ACS training in Joint and combined operations is needed across functional areas to achieve interoperability as well as the need to establish a more formalized training program for coalition operations where collaborative planning, information-sharing, and common operational pictures are exchanged and shared with various coalition partners.[13]

Additionally, the report identifies several additional logistics themes. First, "forces not adequately trained to perform their missions" and "individual personnel are forced to haphazardly learn as they go" are recurring problems.[14] Another concern was lack of knowledge about "duties, responsibilities and procedures," citing recurring topics such as "confusion regarding Joint responsibilities," "lack of standardized procedures concerning how various US government agencies should interact," and "lack of guidance and concept of operations dealing with Joint forces interaction."[15] Other concerns in the report included time-phased force deployment data production, war reserve materiel processes, and inadequate in-transit visibility, fuels planning, and site surveys—all of which are part of the education and training program of today's Air Force logistician.[16]

The onset of September 11, 2001 and continuous, steady-state deployments have accelerated the need to revamp logistics officer education as it pertains to the operational level of war. As stated in multiple after action reports, the GWOT has identified shortcomings in logistics education and training at the operational level of war. These shortcomings are compounded by the heavy demands placed on LROs in the GWOT (constant deployments) which has shortened the Service's ability to make changes in logistics curriculum and training that will generate an immediate return on investment. According to Marine Corps Lieutenant Colonel Williams, a veteran planner during Operations Desert Shield and Desert Storm:

> This prerequisite to somehow acquire instant cross-functional expertise becomes paramount in the area of responsibility, where time is precious and every minute wasted learning on the job is a minute closer to mission failure. If logistics cannot support the sequence of events in the operational plan, it is not a plan at all but simply an expression of fanciful wishes.[17]

It is difficult for any officer to instantly know and understand operational level or theater-wide logistics planning; however, proper, well structured education and training can minimize the learning curve and ensure logistics is always ready to successfully execute the operational plan.

Senior Air Force Logisticians' Perspectives

In addition to reviewing lessons learned from recent operations, a series of interview questions were prepared and distributed to senior Air Force logisticians (colonel). The interviews represented an initial qualitative study to validate lessons-learned reports and the need to conduct this initial research project. The interview questions were coordinated with the LRO career field manager for appropriateness, succinctness, and clarity. The career field manager felt the interview questions were critical to the success of the research to help determine the *pulse* of senior Air Force leadership. Once approved, the questions were electronically mailed to 104 colonels assigned to logistics positions as well as core senior Air Force logisticians; however, because of leave, deployments, and personal issues only 101 officers could respond to the interview questions. In consideration of senior Air Force logisticians' personal demands on time, the interview was limited to five questions. Prior to the distribution of the interview questions, the LRO career field manager sent an electronic mail encouraging the senior Air Force logisticians to complete the survey and provide as much details as possible to assist in furthering this research project.

The issues of education, training, and how many logistics experts versus specialists are needed have been discussed among senior Air Force logistics leadership for some time. A qualitative analysis of the interview responses supported some of the findings from the lessons learned documents as well as provided a senior-level perspective on whether Air Force logisticians are both prepared educationally and trained to perform at the operational level of war. During the interview, officers were asked the following question.

> In your experience, are Air Force logisticians prepared both educationally and with training to perform at the operational level of war? For example, do you feel that we effectively *grow* LROs to serve as Joint planners on COCOM staffs? If not, what are some of your recommendations?

The respondents answered the question with a simple yes or no (as designed). Approximately 75 percent of senior Air Force logisticians responded that they believe Air Force logisticians are not adequately prepared through education or training to operate at the operational level of war. Only 16 percent of senior officers thought Air Force logisticians were prepared to function at the operational level of war, while 9 percent were neutral or noncommittal. The large number of senior officers concurring with the question clearly indicates that a greater focus should be placed on training and educating Air Force logisticians to operate at the operational level of war. In fact, one senior officer said:

> I think we end up [referring to current logistics education and training] with a jack-of-all trades and expert at none. Sometimes a little knowledge is good, but when you need to resolve a thorny issue you want a subject matter expert.

In addition to the first part of this question, most respondents provided detailed commentary on the challenges facing Air Force logisticians at the operational level. A majority of respondents (66 percent) believed more emphasis should be placed on teaching Joint doctrine and concepts at the CGO level. This foundation ensures Air Force logisticians are better educated and trained to operate at all levels of war. Finally, 15 percent of senior Air Force logisticians believe more wholesale logistics training and education is needed. Wholesale logistics involves the acquisition, purchasing, and distribution of supplies and equipment to end users in the field. It is commonly associated with the depots of Air Force Materiel Command or the Defense Logistics Agency.

The second interview question requested respondents identify what critical skill sets are required to perform as an Air Force logistician. All 44 respondents unanimously agreed that the five core competencies identified on the survey (material management, air transportation, distribution, contingency operations, and fuels) were the correct core competencies or functional expertise that Air Force logisticians should be educated and trained for in order to successfully perform at all levels of war. The respondents did not identify one competency as being more important than the other. One anonymous senior officer stated:

> We need to grow a certain number of officers with extended expert knowledge in specifically targeted areas like contingency operations and distribution. Our challenge will be identifying this select set early and keeping them on track with the right training, education, and job experience to fill the requirement.[18]

More than 80 percent of the respondents believed that some pool of Air Force logisticians should specialize in the core competencies identified previously, while others should remain more generalist, capable of advising, working in any of the various competencies, but unable to provide knowledge of the subject area.

The remaining questions on the survey yielded qualitative data that was instrumental in shaping proposed career field paths for Air Force logisticians. The goal is to develop a logistics career path that provides the right, future expertise needed for officers to successfully understand and execute at the operational level of war. As one anonymous logistics colonel stated: "My experience on [a] combined staff in Korea was that we threw folks in the pool and they either swam or failed with little applicable training or support."[19] This view is from a respondent with multiple tours on Joint staffs to include an assignment at United States Forces in Korea (USFK). Unfortunately, this reply was not isolated and reverberated across the interview respondents. It is obvious that the Air Force must better prepare its logisticians to succeed at the operational level of war. The recommendations and suggestions provided by the senior Air Force logisticians were tailored by the officer's own personal experiences, but taken together, provided almost 900 years of experiences. These suggestions and recommendations are addressed later in more detail.

Education

In order to help shape future education and training requirements for Air Force logisticians, a review of current Air Force logistics officer education and training programs, as well as a review sister-Service programs, was conducted. The Navy's supply officer corps and the Army's quartermaster and transportation officer duties closely resemble the Air Force logistician in mission scope and responsibility. A brief overview is provided on Air Force and sister-Service training and education in the following sections. A comparison with the Marine Corps logistics education and training program was not possible because of other mission needs and competing priorities at the time. A cursory review of their logistics officer corps identifies 15 distinct officer specialty codes that including ordnance, maintenance, embarkation officer, making a sister Service comparison very difficult.

Current Air Force Logistics Education Program

The basis for educating and training the Air Force logistician can be found in the Career Field Education Training Plan (CFETP). The document was reviewed to determine mandatory Air Force logistician training requirements. Only two courses are described as mandatory for Air Force logisticians. They are the Logistics Readiness Officer Basic Course and the Logistics Readiness Expeditionary Course (LREC). The current Air Force logistics training and education path is shown in Figure 1.

Before the officer attends his or her in-resident technical school training, unit commanders or equivalent are expected to develop and implement rotational training plans that allow junior LROs the opportunity to experience different functional areas. According to the CFETP, the objective of this program, known as the Logistics Officer Orientation Program (LOOP), is "to provide a foundation for their career in logistics readiness."[20] Additionally, LOOP provides the Air Force logistician an introduction and familiarization of information systems, processes, and programs prior to the officer attending formal technical training. This provides the officer with maximum opportunity to take advantage of technical training. LOOP is a three-phased program: Phase I consists of an initial interview, Phase II consists of LRS and support agency orientation, and Phase III consists of equipment and vehicle familiarization. In developing the orientation program, commanders should use mission briefs, tours, *shadowing*, and directive reviews to accomplish the objectives of the program.[21] As illustrated in Figure 1, newly accessed or cross-trained Air Force logisticians attend the LRO Basic Course. This is a 12-week, in-residence initial skills training course taught at Lackland Air Force Base (AFB), Texas. After graduation from the basic course, LROs are required to cycle through the different functional areas in order to acquire basic, hands-on experience in each area. LROs are required to spend a minimum of one year working in each area. The squadron commander or supervisor decides if the officer has *mastered* the training and then *signs them off* as trained in that functional area. Although some formal courses are available, mainly in the areas of logistics information systems, the vast majority of training is on-the-job (OJT) training. Most of the OJT will be dependent on the officer's initiative and the capabilities of their senior and junior enlisted personnel. At this point, the officer is considered trained and educated in the functional area. This process led one senior Air Force logistician to remark, "I believe the LRO is trained about an inch deep and a mile wide which is ineffective in my opinion."[22] Unit commanders must formally certify, through Base Training, that the LRO has met the minimum criteria for the functional area in question.

Once certified, these LROs are awarded a special experience indicator (SEI) indicating they have completed the requisite OJT in one of three main areas: distribution management, materiel management, and contingency operations. According to the CFETP, "each accession LRO will be required to attain proficiency in each of the three core competencies before attaining the designation of *fully qualified.*"[23] The standard time frame for LROs to reach fully qualified status is anywhere between four to six years of commissioned service time.

The second mandatory Air Force logistics training course is the newly developed LREC course. LREC is a ten-duty-day, in-residence course that is also taught at Lackland AFB, Texas. The purpose of LREC is to provide field grade LROs operational level training with an emphasis on command and control within an expeditionary operations framework. It is designed to prepare LROs for increased responsibility in the logistics readiness squadron (LRS) as well as positions at the Joint and AFFOR levels.[24] The CFETP requires all Air Force logistics majors and major selects to attend LREC.

There are other elective courses provided by various institutions; however, these are unit funded and scheduled training and education events. Units may not have the funding to support the officers' temporary duty to one of these classes. The following is a short list of potential elective classes available to Air Force logisticians.

- Air Force Institute of Technology short courses such as Logistics 199, 299, and 399
- Defense Acquisition University courses
- Contingency Wartime Planning Course

- Various sister Service and Joint courses such as the Joint Course on Logistics (Army) and the Joint Planning Orientation Course (Armed Forces Staff College)

For the purposes of this research, it is enough to know that the courses are available, but they are not mandatory courses required by the Air Force logistics community.

Current Navy Supply Officer Corps Education Program

As you can see in Figure 2, the Navy utilizes three pillars (similar to a Greek Parthenon) to illustrate officer professional development. The pillars are based on officer qualifications, assignments, and education. Unlike the Air Force, the Navy directly emphasizes the performance of the officer as part of his or her overall development track (base support of the pillars). The Air Force implies performance, by providing promotion opportunities and simulating progression through the ranks, but is not as deliberate as the Navy in stressing the need to do one's job well. Ultimately, these pillars support the worldwide placement of naval forces (Parthenon ceiling).

The Navy lacks a designated logistics officer corps; however, the Navy Supply Corps performs many of the same functions (supply, transportation, fuels, and embarkation/debarkation functions) as its Army and Air Force counterparts. The Navy Supply Corps is a highly trained, specialized team of professionals, who perform executive-level duties in financial management, inventory control, physical distribution systems, contracting, computer systems, operations analysis, material logistics, petroleum management, retailing, food services, and other related areas.[25] Upon being commissioned in the Navy and being assigned to the supply corps, officers will attend the Navy Supply Corps School in Athens, Georgia. Unlike the Air Force, Naval officers attend this class before being assigned to their first operational duty. The mission of the school is to train students in the duties of Supply Corps officers afloat and ashore to successfully perform as naval officers in a variety of functions and under a myriad of conditions with credit to themselves, the corps, and the naval service.[26]

Once a student graduates, the officer's first assignment will be at sea. This assignment is not considered natural evolution, but is an opportunity for the officer to perform.[27] Success at sea is similar to successful company command in the Army. If the

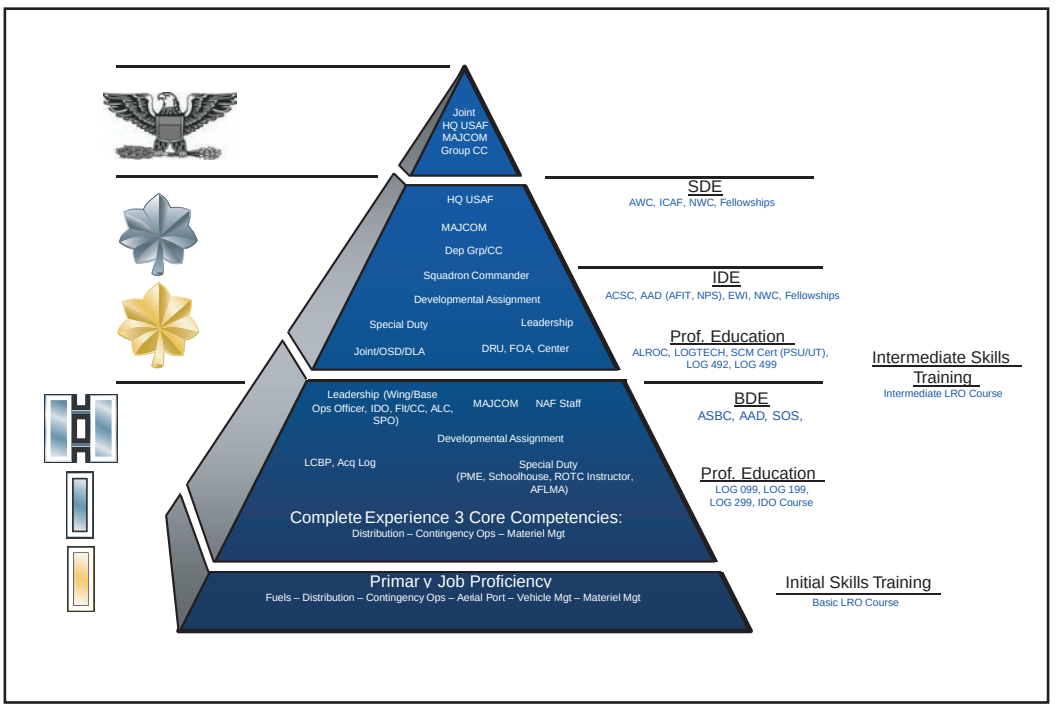

Figure 1. Air Force Logistics Officer Career Pyramid

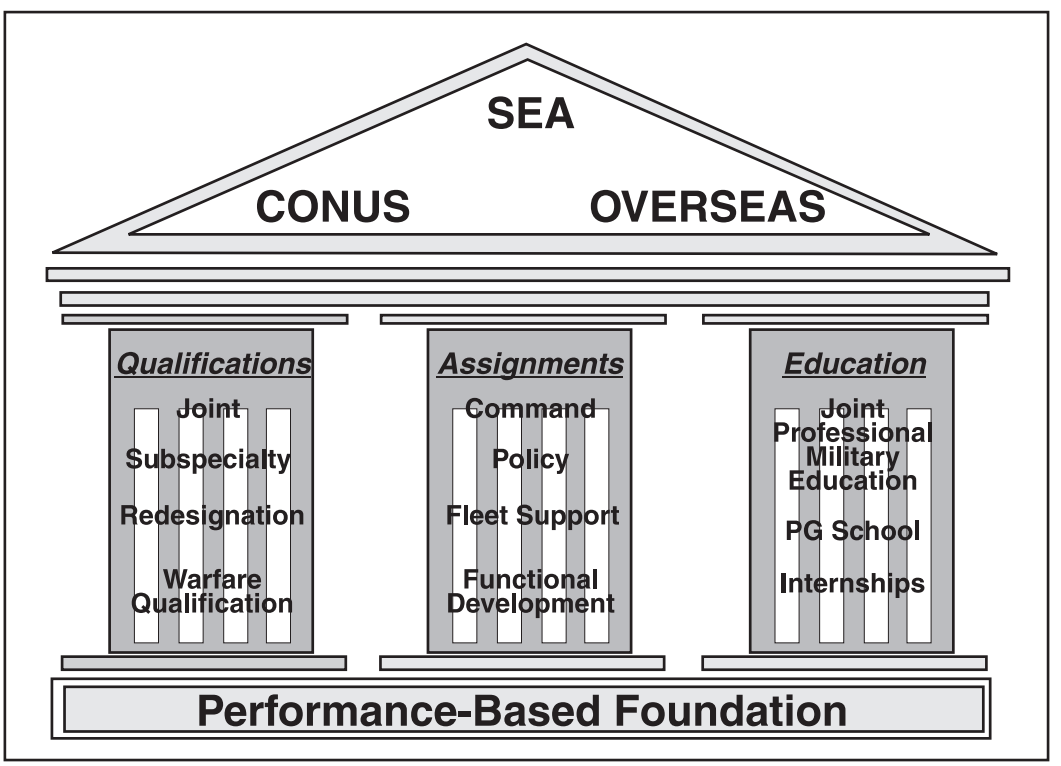

Figure 2 Navy Career Development Components

officer does well, then he or she can expect to be given greater responsibility with each new assignment.

As an officer gains experience, he or she is awarded additional qualification designators (AQD) to mark that experience. The AQDs are similar to the Air Force's SEIs. Unlike the Air Force SEI program, a Navy officer loses proficiency in the AQD if he or she has not worked in that discipline for more than 12 years.[28] Additionally, an officer may be awarded a subspecialty functional code (S-code) that identifies an officer's field of advanced education, functional training, and significant experience. Requirements to earn an S-code vary by subspecialty, but an officer must work in a designated billet from 18 to 24 months to be awarded the S-code.

The Navy has a host of education opportunities to offer its supply officer corps. Figure 3 provides a more detailed view of education opportunities afforded to naval supply officers. Of note are the large numbers of intern programs (80) that are available to officers. These positions are competitively filled, but offer a fantastic opportunity to receive specialized education. Similar to the Air Force, the Navy offers a host of masters degrees in logistics specialties (transportation, supply, fuels) at the Naval Post Graduate School, Monterey, California. The Air Force offers similar programs at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio. Because of funding cuts, these academic degree producing programs have been reduced from a peak of 30 to 40 positions in the late 1990s, to 3 to 4 academic positions annually. Over the course of the review, the Navy Supply Officer corps career field was found to operate very similarly to the Air Force as well as offer many of the same education opportunities available in the Air Force; however, its reverberating verbiage of pride made the Navy stand out from the other Services.

Current Army Quartermaster Officer Education Program

In comparison to Air Force logistician training, the Army first qualifies its logistics officers in branch-specific Basic Officer Leadership Course III (BOLC III) such as Quartermaster, Ordnance, and Transportation. These courses range from 14 weeks for the Quartermaster Basic Course to 19 weeks for the Ordnance Officer Basic Course. The purpose of the course is to provide an educational foundation to serve in any *entry level* position in that field. For example, the purpose of BOLC III for the quartermaster is

> …to train lieutenants on the unique functions performed by quartermaster soldiers. Training focus is on technical supply, materiel management, petroleum, and water functions of quartermaster platoons and an introduction to the general functions of logistics. This focus develops graduates as quartermaster generalists, capable of filling any quartermaster lieutenant position (except aerial delivery positions).[29]

BOLC III is akin to the Air Force logisticians technical school training offered at Lackland AFB, Texas.

At the three- to four-year point captains and captain selects attend the Combined Logistics Captains Career Course (CLC3). CLC3 provides advanced-level training in tactical planning functions and multifunctional logistics skills and can be considered a primer for future assignment to a division or COCOM staff. In accordance with Army Regulation 600-3, *The Army Personnel Development System*, the intent is to prepare Army officers for duties as company commanders and staff officers on multifunctional staffs.[30] The course length is 24 weeks and is divided into four separate phases. This class is taught at the Army Logistics Management College (ALMC) at Fort Lee, Virginia. Phase One is approximately six weeks in duration and is focused on preparing soldiers to command company-sized units. Phase Two of the course is five weeks and trains CGOs in their branch specific critical tasks at a regimental (or branch) school. Phase Three is seven weeks in duration and is focused on training the student in multifunctional logistics. Phase Four is six weeks in duration and is titled the Combined Arms and Services Staff School (CAS3). It trains students in staff procedures, which is similar to the Air Force's Squadron Officers School. This phase is taught at the Command and General Staff College, Fort Leavenworth, Kansas.[31] The Army also provides a Support Operations Course (SOC) to help branch-specific qualified officers transition into the logistics branch.[32] This course is designed to provide critical knowledge to enable officers to lead, plan, and execute sustainment support in small-scale contingencies as well as in a major theater of war. Students learn what doctrine is and how tactics, techniques, and procedures affect their ability to provide logistics in the field. SOC is taught in two phases; the first phase is distance learning and the second is two weeks of classroom training at ALMC, Fort Lee, Virginia.[33]

A variety of functional assignments are identified at the platoon, company, brigade, and battalion level that an officer should strive to fill in order to build a solid foundation for future, increased responsibility. It is similar to the Air Force pyramid previously discussed, but the officer's path is framed

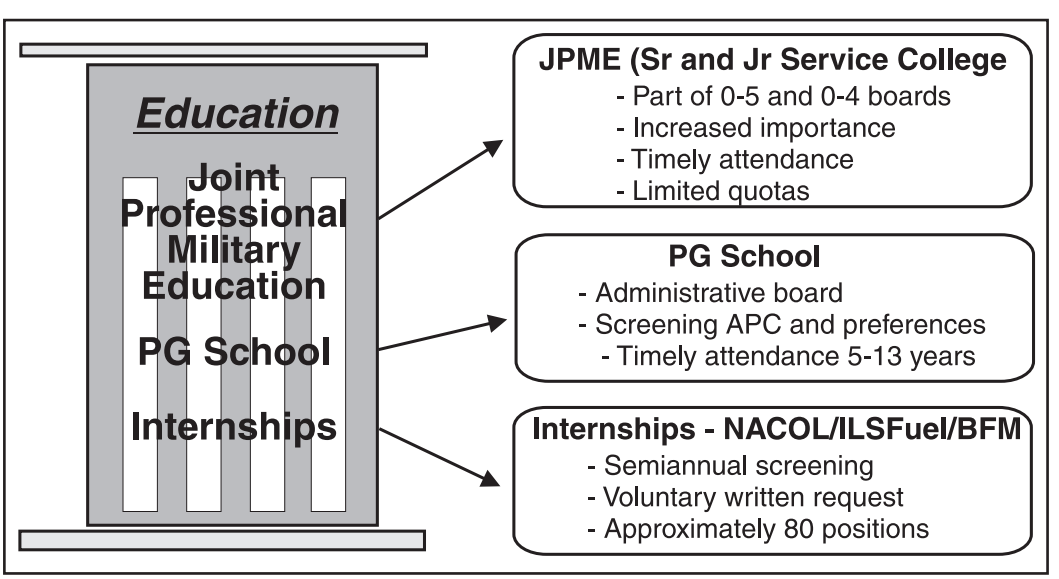

Figure 3: Navy Education Pillar

around education and training versus the Air Force where the focus job types are the centerpiece.

The Army merged its various logistics disciplines in 2008 (similar to what the Air Force accomplished in 2002) as part of its continued transformation to meet the needs of the warfighter in the field. Unlike the Air Force, the Army has a history of providing the necessary education, training, and experiences to deliberately develop officers to meet the various levels of war. This forethought is evident in the education and training opportunities that are continuously offered to officers at all grades.

Observations from Sister Services

As seen in the sister Service comparisons, logistics training and education in the Army and Navy appears to be more regimented and better funded. The biggest concern in Air Force logistics education and training is the eight-year gap between formal education programs (initial technical training as a second lieutenant followed by LREC as a major). The Army and Navy systems take a more holistic approach, scheduling increasingly difficult education and training that builds upon the officer's experiences as he or she progresses. These steps are in line with the Elaboration Theory education model. That is, organizing course structures in a simple to complex sequence which reflect the course's primary focus.[34] Also, the education and training is geared toward developing functional experts who will perform well at all levels of war, but specifically, their educational and training programs address operating at the operational level of war. Within the Air Force, an officer may not be formally prepared for success on a COCOM or AFFOR staff, but he or she may be successful through hard work. As one senior Air Force logistician declared:

> Too much of all of the above happens randomly; if one happens to work in a job where they are exposed to this, then they pick it up, but that's not a very well-designed system to create highly competent O-6 LROs across the board.[35]

Despite differences, all three Services emphasize the need for education and training opportunities. In fact, the Navy appears to offer more formal education programs (masters degrees) than either the Air Force or the Army. This was quite surprising.

Mathematical Model to Determine Senior Officers

The LRO career field is a scant ten years old, but since September 11, 2001, LROs have been in increasingly high demand to fill in lieu of (ILO) taskings and Joint billets. The career field contains approximately 1,725 officers (lieutenant colonel to second lieutenant), but fills 106 365-day temporary duty (TDY) ILO taskings annually.[36] Such a small career field with such heavy and oftentimes competing demands must ensure it is educating and training its future senior leaders to effectively perform at all levels of war. As a mechanism for focusing educational requirements, the author took a top-down approach to determine how many officers would be needed to meet the needs of COCOM and AFFOR staffs.

The mathematical model in Table 1 represents how many Air Force logistics O-6s may be produced from the 2003 year group (identified in the *Generates* column) with either a generalist or specialty core competency. This model begins to fill in the gaps for LRO career field managers to determine how many officers should be selected to become specialists in a particular core competency. The model is robust enough so that the year group population sizes can be easily substituted to determine how many officers should be identified with a particular core competency by year group.

To utilize the model, the author analyzed the 74 LRO O-6 authorizations and determined which authorizations may be classified by functional expertise (critical skill set). Table 2 provides a breakdown of the O-6 authorizations and their corresponding critical skill set. A generalist position denotes the officer does not require a deep understanding of a particular LRO competency to successfully fill this position. LRO O-6 positions that require a more a deep understanding of a particular core competency (materiel management, air transportation, distribution, contingency operations, and fuels) were determined by reviewing the organization that the position is assigned to, the MAJCOM subidentification, and the authorized program element code. The core competencies are identified in the current 2005 LRO CFETP and were validated as being critical requirements during electronic interviews of over 100 senior officers filling LRO O-6 authorizations. The O-6s that responded to the interview identified these core competencies as the most required to successfully perform in their current position.

After matching a core competency against an O-6 authorization, each core competency category was divided by the total number of O-6 authorizations. This product is the

LRO Core Competency	O-6 Job Breakdown	Percentage	Number of Officers from Year Group Matched to Skill	Rounded	Generates
Generalist	43	58	66.82	66	7.06
Material Management	8	11	12.43	12	1.28
Air Transportation	8	11	12.43	11	1.18
Distribution	8	11	12.43	12	1.28
Contingency Operations	6	8	9.32	9	0.96
Fuels	1	1	1.55	5	0.54
Total	74	100	115	115	12
Year Group Population		115			
12.30839564 – Number of officers expected to make O-6 starting with 5 years CYOS 43.5 percent of officers with strategic vector					

Table 1. 2003 Year Group Officers With Five Calendar Years of Service (Forecasting Model Developed by Author)

percentage of O-6 jobs by core competency. The percentage was multiplied by the number of officers in a year group to determine a rough estimate of how many officers from a year group should be identified to fill the particular core competencies. Because there is only one fuels position at the O-6 level, the author rounded the year group percentages for each core competency downward and shifted these fractions to the fuels core competency. This provided a more realistic picture on the number of officers to be identified by year group to follow a fuels education and training path. Thus, this *rounded* number becomes the basis for the formula discussed below. The manual manipulation of the data at this point provides a sense of logic to the outcome of the mathematical model and does not affect the validity of the data generated.

Once the core competency requirements were determined, the author created a formula designed to take an officer year group's population size, multiplied by the career field's retention rate (7-year average) and multiplied by line of the Air Force promotion rates (major, lieutenant colonel, and colonel) to generate the number of O-6s by core competency for that year group as the officer progresses toward 20 years of commissioned service. The retention and promotion rates are Air Force averages and can be substituted in the model if new rates become available. The results of this formula enable career field managers to determine the quantity of officers needed by core competency as well as determine the education and training track (discussed in previous section) to fill logistics officer requirements on the AFFOR and COCOM staffs. The formula used to generate the results listed in Table 1 is outlined in Table 3. Most Air Force O-6s rotate every two years, but with successive year groups ahead and behind the example year group illustrated previously, there should be sufficient officers, by core competency, in the *pipeline* to fill potential O-6 openings regardless of core competency.

Skill Sets	Number of Authorized O-6 Positions Requiring Specialized Skill Set	Percent of O-6 Positions
Generalist	43	58
Material Management	8	11
Air Transportation	8	11
Distribution	8	11
Contingency Operations	6	8
Fuels	1	1
Total	74	100

Table 2. Senior Air Force Logistics Positions (AFPC/DPAPA, 9 February 2008 and Author Developed)

The following is the forecasting formula developed to determine how many officers by year group should be identified with a particular core competency.

= ((((((population x retention rate to reach 8-yrs of CYOS) x O-4 promotion rate) x retention rate to reach 12-yrs of CYOS) x O-5 promotion rate) x retention rate to reach 20-yrs of CYOS) x O-6 promotion rate)

The formula was built into Microsoft's Excel program and the results are provided in Table 1. To verify reliability, the model was *run* 100 times and the results were consistent during each iteration.

Table 3. Forecasting Formula (Developed by Author)

To determine the retention rates of LROs, the author coordinated with the Air Force Personnel Center (AFPC) and obtained the Air Force approved retention rates for the LRO career field (see Table 2).[37] These rates are calculated based on seven years of data. These same retention rates aid in determining the sustainment models generated for each career field. The sustainment models are used to determine accession targets by AFSC, possible force shaping targets, and other *health of the fleet* information.

To calculate the retention rates, AFPC's analysts determine the number of officers that started the year on active duty by commissioned years of service (CYOS). The fraction of officers that completed the year is divided by those that started the year and is expressed as a percentage. This initial data is used to determine the Cumulative Continuation Rate which can be defined as the chance that an officer entering the Service with zero CYOS will complete *X* years of service.[38] For example, as shown in Table 4, there is a 72 percent chance that once an officer reaches five years of commissioned service he or she will continue and complete eight years of commissioned service.

One year's worth of data is not considered statistically viable, thus, seven years of data are used to determine career field trends and provide a better approximation of an officer remaining on active duty. To further illustrate, Figure 4 graphically depicts the life of an LRO year group over a 30-year career. The X axis represents commissioned years and the Y axis represents the population of LROs by percentage. The black line represents the cumulative retention rate for LROs. Thus, Figure 4 graphically depicts how many LROs will be available at a certain commissioned year point. The line is fairly smooth and depicts a natural attrition of officers (retire or separate). This enables senior logistics leaders to focus education and training before the LROs moves into the next level of leadership and ensure enough LROs are on hand to fill critical COCOM and AFFOR positions.

Conclusion and Recommendations

This research indicates that LROs are unprepared to serve at the operational level of war and the Air Force's education and training program should be overhauled to meet the needs of the COCOM and AFFOR staff. Over half of the senior Air Force logistics officer population was interviewed and the results were used to determine how to educate and train Air Force logisticians. As one senior officer stated, "believe we need to identify around the senior captain time frame the LRO track an individual will be going—only way to build our future LRO leaders…"[39] This was the prevailing thought among the interview respondents. The majority of interview respondents believed that an Air Force logistician should follow one of six tracks (generalists, materiel management, air transportation, distribution, contingency operations, and fuels). For the purposes of this research, a track is defined as a specialized career plan that leads to the education and training of an officer to serve as a functional expert. However, before individual officer tracks are identified, it

was necessary to determine how many and what type of officer would be placed on that track. A mathematical model was developed that calculated how many officers by year group were needed to be functional experts. The model calculated a pool of officers robust enough to ensure enough officers would be promoted to O-6 and have the right education and training in order to provide advice on time sensitive decisions to COCOM and AFFOR staffs. The right officers, with the right skills should speed up the decisionmaking process and lead to greater unity of effort on the COCOM and AFFOR staffs.

Once functional expert training plans are put in place, a tracking mechanism will need to be developed to keep track of the functional experts. The current Air Force logistics SEIs provide an in-place mechanism to locate officers with functional expertise on demand. It will more than likely fall on AFPC's assignment team to track and monitor LROs identified as functional experts.

Based on the research on which this article is based, the Air Force should identify a set number of logisticians by year group to become functional experts in the five core competencies (material management, air transportation, distribution, contingency operations, or fuels) as well as identify officers to serve in generalists positions. Figure 5 provides an example career path for an LRO who has been identified to become a material management functional expert. The figure flows from left to right. To begin, the officer would enter the Air Force and begin an initial assignment in an LRS. At his or her initial assignment the officer would attend technical training at Lackland AFB, Texas and then master as many competencies as possible during the assignment. The squadron commander would certify the officer in any discipline he or she believes the officer has successfully learned. This will provide the officer with the basic logistics foundations and processes at the base or retail level. Their second assignment carries them into the wholesale world at the depots or logistics support centers. This combines an officer's retail level foundation with a wholesale piece. At this time, the officer may attend a 30-day training course that focuses the officer's education on materiel management as well as provides some Joint and leadership training to prepare them for future challenges. For LROs to truly grasp the operational level of war, they will need an intermediate course that fills in the current gap between lieutenant and major. Additionally, the officer may pick up some acquisition experience. When the officer has completed this assignment, he or she would go back to the base level and serve as the supply chain flight commander (largest LRS flight)—applying wholesale and retail knowledge to improve flight line operations (sortie generation, spares support). The officer would then move to a major command staff or possibly fill a Joint billet at the Defense Logistics Agency. Either job would complement the officer's functional expertise. By this time the officer may attend professional military education or pursue squadron command. After completing the command tour, the officer would move to Headquarters Air Force or possibly the Global Logistics Support Center. This career path aligns the officer to become a future material group commander when he or she is promoted to colonel. This assumes, of course, the officer will accept the guidance and mentorship provided to them by senior officers. Additionally, this path assumes an officer will serve 24 years in the Air Force; however, the model does take into account retention. If the officer did elect to separate or retire, there are other officers following the same path to take his or her place.

Recommendations

In order to build upon the initial qualitative information collected in the interview questions, the author recommends conducting an additional scientific survey to validate the results across the Air Force logistics career field. A standard deviation of 5 percent is desired; however, the survey will need to be distributed to a much larger population. According to the sample size calculator software provided by Creative Research Systems, if a survey is addressed to all 750 Air Force logistics FGOs, then 254 respondents are required to generate a standard deviation of 5 percent.[40] A small standard deviation is desired to demonstrate that the responses were tightly clustered about the mean and not dispersed across a standard bell shape curve. A large standard deviation indicates data scattered across a normal bell curve and can lead to concerns about the validity of the data.[41] Furthermore, this ensures the data collected falls within 2 standard deviations of the mean; thus, the data is considered to be normally distributed along a standard bell curve.[42] Since the data is normally distributed, it is reasonable to surmise that the data generated from the responses would be valid across the entire senior Air Force logistician population (+/- 5 percent).

Commissioned Years of Service	Cumulative Continuation Rate
1-4	87%
5-8	72%
9-12	81%
13-20	58%

Table 4. Retention Rates

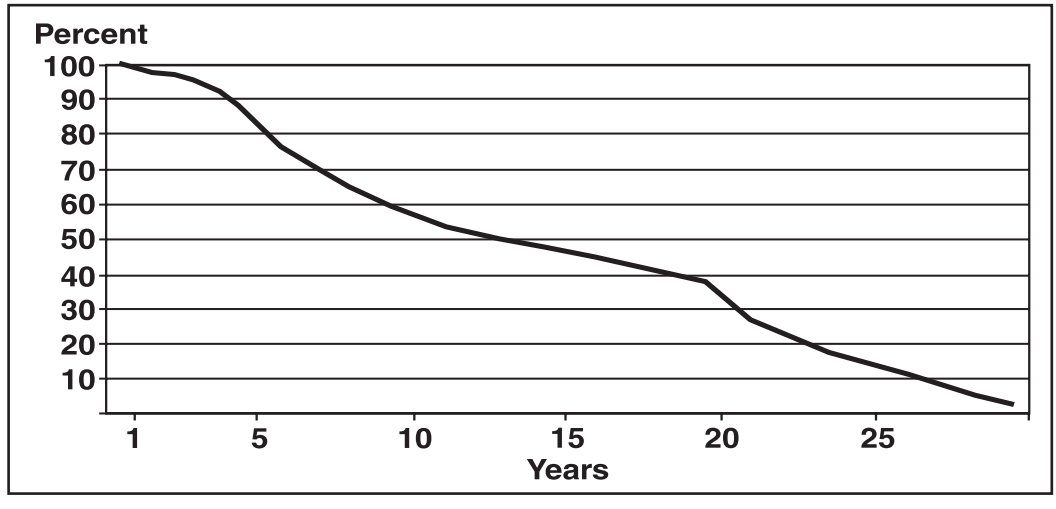

Figure 4. Cumulative Retention Rates for LROs

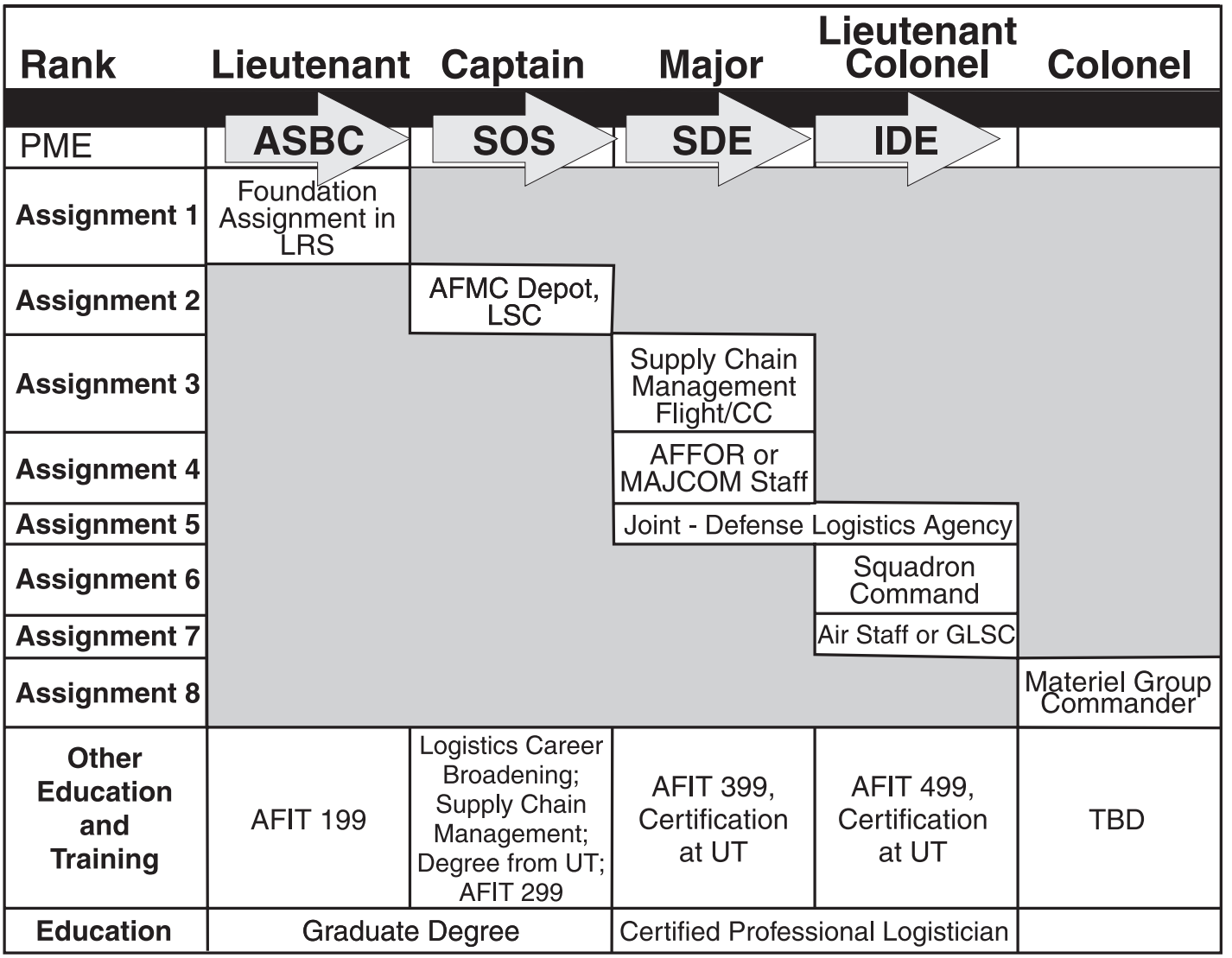

Figure 5: Material Management Functional Expert Career Path (Author's Depiction)

The functional expert career tracks were limited to the author's own knowledge, his research, and his interview respondents. Further research needs to be performed to determine the proper education and training path to become a functional expert in one of the logistics core competencies. For example, a panel of subject matter experts should be put together for each competency and instructed to *hammer out* a detailed education and training path that deliberately develops officers for the operational level of war. It would enable LROs to have their education spread out over their careers. This would continuously reinforce officer education and allow it to be tailored and focused as the officer progresses. This approach allows the Air Force to develop a credible education and training program to ensure a steady induction of officers into the training and education pipeline, leading to the creation of a continuous stream of logistic subject matter experts prepared to serve at the operational level of war. Ultimately, education would become an enabler to prepare LROs to meet future logistics requirements.

Operation Iraqi Freedom was probably the best example of the United States military's ability to wage Joint, coalition warfare to support the National Security Strategy.[43] Continued success hinges on strong education and training to prepare our logisticians to serve at the operational level of war.

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It will not do to leave a live dragon out of your plans if you live near one.

—John Ronald Reuel Tolkien

Tomorrow's warriors will have to relearn the things that today's warriors have forgotten.

—Gen Billy M. Minter, USAF

Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information on it.

—Samuel Johnson

The society which scorns excellence in plumbing because plumbing is a humble activity, and tolerates shoddiness in philosophy because it is an exalted activity, will have neither good plumbing nor good philosophy. Neither its pipes nor its theories will hold water.

—John W. Gardner