An AETC Vision
for Learning Transformation

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AIR EDUCATION AND TRAINING COMMAND
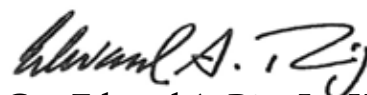## 28 February 2013

Contents

We have an opportunity now, within AETC and the Air Force, to transform how we deliver education and training. This opportunity is driven by a future environment with more constrained resources and enabled by modern advances in technology and learning methodologies. By leveraging this opportunity, we can change the paradigm of how we deliver education and training to our Airmen so that it is more effective, more personalized, and more persistent and will likely save resources by being more efficient.

This white paper describes a vision for a future learning environment within the Air Force that follows a number of first principles of learning. These principles can be used to guide our actions and decisions toward a future state that is less about teaching and more about learning—a state where there are alternative engaging ways to deliver education and training beyond the typical brick and mortar classroom with an instructor on a platform talking to students; where students have access to content anytime and anywhere, accept responsibility for their own learning, and are able to progress at their own pace; and where we meet validated learning objectives, protect Airmen's time, and minimize cost.

This white paper also describes examples of how these first principles can be put into practice in several notional careers within the Air Force. These examples are not directive but are illustrative of how a transformative shift in how we deliver education and training can practically be applied within a learning environment that merges education, training, and experience to deliver life-long learning to each Airman appropriate for his or her career.

Change will not be easy or quick. However, we must recognize and embrace the circumstances of the current environment and seize the opportunity to improve the learning experience with innovation and efficiency. The result will be a continued ability to support the world's greatest Air Force—powered by Airmen, fueled by innovation!

Gen Edward A. Rice Jr., USAF
Commander, Air Education and Training Command

The Air Force will need to operate with reduced resources in the future and yet maintain its world-class tradition of providing the best recruiting, training, and education. To do so, we must critically review the force development model to screen out antiquated processes, procedures, and policies while innovatively employing new technologies to deliver the same high level of graduates with reduced resources. If done correctly, this process will also increase effectiveness.

This implementation plan is divided into two chapters. Chapter 1 offers a vision of Air Force learning that describes how the future state should look. It contains the *why*, *how*, and *what* of our vision and lists the basic ideas used to guide the construct of the future state in the AETC First Principles of Learning, listed here:

1. The Air Force learning environment is adaptable.

2. The learning environment is effective and efficient in meeting validated learning objectives, protecting Airmen's time, and minimizing cost.

3. Technology is leveraged to deliver the most innovative learning environment possible, standardized across the Air Force.

4. Learning is available anytime and anywhere.

5. Students are responsible for their own learning.

6. Instruction is more interactive, self-paced where possible, and appropriate to the desired outcome.

The vision discusses in detail the linking of operational factors contained in AFDD 1-1, *Leadership and Force Development*, to implications for the future. It also describes the learning environment and learning framework and highlights key transformational concepts. To reach this vision for future learning, the governance and policies affecting learning for the Air Force will require adjustment, already initiated with the formation of a new service core function of education and training, led by the AETC commander as the core function lead integrator.

Chapter 2 completes the vision and provides three examples of how these ideas can be implemented within the typical Airman's career. These examples are purely notional but illustrate how innovative ideas can be deployed practically into an Air Force future learning state.

People are the Air Force's most critical asset. Airmen turn competencies into required capabilities. For this reason, the art of employing Airmen with the requisite education, training, and experience is fundamental to the effectiveness of the Service, affecting current operations and future capabilities. Force development is a deliberate process of preparing Airmen through the continuum of learning (CoL) with the required competencies to meet the challenges of the 21st Century. The CoL is a career-long process of individual development where challenging experiences are combined with education and training through a common taxonomy to produce Airmen who possess the tactical expertise, operational competence, and strategic vision to lead and execute the full spectrum of Air Force missions.

—AFDD 1-1, Leadership and Force Development

Education and training are the foundation of our airpower advantage. To maintain this advantage in the future, we must safeguard and reinforce that foundation. All Airmen, whether teacher or student, have a role in ensuring that we remain the most technically proficient, best-educated, and best-trained air force in the world. We will maximize our Airmen's potential by refining our development programs to move beyond classroom-based instruction and incorporating leading-edge educational concepts. Through a personalized, career-long building block approach, we will eliminate duplicative and extraneous training, returning valuable time to our Airmen. We will also integrate our development, promotion, and assignment processes to recognize excellence and grow Airmen to have the breadth, knowledge, and capabilities to serve where our nation needs them.

—Gen Mark A. Welsh III, Chief of Staff, USAF

We have an opportunity to build a fundamentally different construct for recruiting, educating, and training the force. If we do it right, it will require less resources and be more effective.

—Gen Edward A. Rice, Commander, AETC

The purpose of the learning transformation described herein is to continue producing quality Airmen in a resource-constrained environment. This AETC paper describes a *vision* of what *learning* within the Air Force should look like in the future.

This document is divided into two chapters. Chapter 1 is the vision and includes guiding concepts used to develop a picture of how learning should look for the Air Force in the future. These concepts include the AETC First Principles of Learning, operational factors, and the learning environment, framework, and governance. Chapter 2 includes notional examples of how this vision will look in typical Airmen's careers.

Why, How, What

Why we must change involves both a "pull" and a "push." The pull relates to the significant opportunity we have to bring technology and innovation to the learning environment in ways that will greatly enhance the learning experience. The push relates to an expectation of reduced funding available to the learning enterprise, which requires that we find ways to continue delivering learning excellence at a reduced cost. *How* we change is to fundamentally alter our long-established paradigms of recruiting, training, educating, and providing experiences. *What* we change are the processes by which we determine learning requirements and deliver content to achieve learning outcomes. This is accomplished through an Air Force vision of how we develop Airmen that incorporates innovation and leverages emerging learning methods that are cost-conscious and adaptive. This paradigm shift will not be easy. The Air Force has more than 60 years' experience developing Airmen and doing so successfully. However, new methods and technologies, as well as an increased emphasis on cost-consciousness, provide a mandate to improve the learning while also reducing the cost. We must be willing to act boldly and not assume that past methods are appropriate for the future or for the current generations of learners.
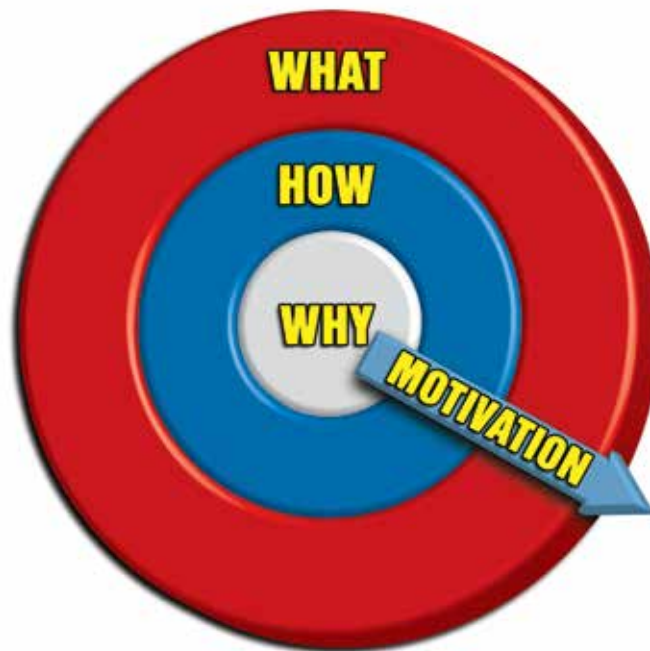
The vision for Air Force learning is about the individual Airman, our most important asset. In an era of diminishing resources, we must challenge beliefs that have historically guided how we develop Airmen. Recent advances in technology, a culture of innovation, and creative thinking offer an opportunity to improve learning methods and change how we educate, train, and develop our Airmen. The current and projected fiscal climate acts as a catalyst, creating a window of opportunity for transformation as we adopt a culture of cost-consciousness.

This chapter presents the vision for Air Force future learning. It describes the AETC First Principles of Learning, which guide the development of a model outlining how the Air Force will continue to provide world-class recruiting and the continuum of learning in a resource-constrained environment. This vision is the basis for the development of individual initiatives that, when implemented, will achieve the desired future state. The concepts presented include operational factors tying AFDD 1-1 to implications, the learning environment and framework, and the ways in which learning governance, along with Air Force policies, will require adjustments.

AETC First Principles of Learning

A Cambridge dictionary defines *first principles* as "the basic and most important reasons for doing or believing something." Macmillan defines them as "the basic ideas or rules about something." To guide the learning transformation, AETC adopted these First Principles of Learning and applied them to craft the ideas contained within this document:

1. The Air Force learning environment is adaptable.

2. The learning environment is effective and efficient in meeting validated learning objectives, protecting Airmen's time, and minimizing cost.

3. Technology is leveraged to deliver the most innovative learning environment possible, standardized across the Air Force.

4. Learning is available anytime and anywhere.

5. Students are responsible for their own learning.

6. Instruction is more interactive, self-paced where possible, and appropriate to the desired outcome.

Operational Factors

To ensure that Airmen are prepared to overcome the array of challenges they face, the Air Force codified a continuum of learning (CoL) in AFDD 1-1. This continuum is "the deliberate process of combining education, training, and experience to produce the right expertise and competence to meet the Air Force's operational needs . . . [in] developing an Airman." Listed below in bold are the AFDD 1-1 common guiding principles of learning and their implications to the continuum principle.

- **Build skill-set expertise**. Design education and training programs with the experience and current skill levels of the participants in mind . . . [at the] *tactical, operational, and strategic* levels.

  Implications: Learning opportunities have to be specifically tailored to the needs of Airmen, recognizing their past development to maximize learning and avoid wasting their valuable time on unnecessary repetition. This process must also measure the learning that occurs.

- **Prepare for change**. Skills development should keep pace with changing operational environments and resulting changing requirements.

  Implications: The barriers between education, training, and experience must be breached so that foundational material presented in formal learning programs is continually reinforced in operational environments. Further, this valuable reinforcement learning, "authentic learning," must be captured in Airmen's records to facilitate deeper learning opportunities in their futures.

- **Create depth of expertise**. Competence and credibility require a depth of experience that provides a foundation for effective leadership. Such depth is not gained overnight but must be honed over time.

  Implications: Learning opportunities need to become less episodic and more ubiquitous, with on-demand access to meet Airmen's developmental needs. Airmen need a robust reachback capability to review past lessons learned as well as increased employment of authentic learning in their workplaces to reinforce important lessons learned.

- **Train to mission demands**. Training to mission needs leverages both resources and duty experience to maximum effect. Skill expertise should prepare individuals for the tasks they are expected to perform to meet mission demands, which may change rapidly with policy or international events.

  Implications: There is an ongoing need for those responsible for training to stay abreast of developments in the creation, design, and delivery of learning op-

portunities. It is not just a matter of reviewing listed requirements, but requires a proactive analysis of duties and responsibilities to deliver what is needed for each Airman. Learning opportunities must develop intellectual agility—adaptability, decisiveness, and acceptance of risk in discovering and testing new and better solutions—so that Airmen can meet the challenges of their diverse and evolving mission sets.

- **Train like we fight**. Success hinges on practicing the profession of arms in the same manner in which it will be executed on the battlefield or during a contingency.

  Implications: Rote learning—memorization—is insufficient for the challenges Airmen face in today's operational environment. They must be challenged in their learning opportunities with realistic scenarios and problems that require creativity and decisive action. This requires a mix of learning methodologies. Airmen must also be assessed to determine the effectiveness of developmental efforts as well as to build their self-confidence and their leaders' confidence in the fighting force.

- **Make training and education available**. In today's high-tempo world, the opportunities to train or receive education have become more challenging. Education and training should be responsive to this shift. Education and training may be more challenging to get while deployed, but should not be neglected for that reason.

  Implications: Those responsible for creating or leveraging learning opportunities must be proactive in anticipating the changing needs of their students or subordinates. They must also reach out to expert communities to capture the best practices and lessons learned to ensure that learning opportunities convey the most up-to-date content. Lastly, learning should build upon previous training, education, and experience to ensure that objectives are appropriately targeted and assessed.

- **Validate education and training through war games and exercises**.

  Implications: While the "learn by doing" model is powerful, in reality not every Air Force mission lends itself to this approach. Because of limits on resources or implications for mission performance, alternatives such as simulations, war gaming, exercises, and even problem-solving challenges may be more suitable to achieve commensurate learning outcomes. Those who conduct operational exercises should reach out to trainers and educators to embed authentic learning opportunities into exercises as well as capture and share lessons learned which are pertinent to the entire force.

- **Value and leverage experience**. Airmen also learn through experience as they apply their education and training daily to the Air Force's missions and tasks. The Air Force lessons learned process provides a ready tool for Airmen to obtain insights

into the experiences of others, avoiding the difficulty of having to relearn pre-existing elements of knowledge hard won by others. Of course, the key component in experiential learning is the first-line supervisor, and that person's role in mentoring Airmen cannot be overstated.

Implications: Beyond the formal lessons learned system, Airmen are connected through multiple networks, providing avenues to share the lessons of their experience widely. Enabled by a robust knowledge management system, professional networks can increase the reach, and impact, of every Airman's experience. Professional online forums can become a clearinghouse for new ideas and a breeding ground for creativity, enabling the best ideas to spread virally. Education and training will also recognize the learning achieved through experience, replacing "one-size-fits-all" instruction with tailored, targeted, high-impact training and educational experiences.

Learning Environment

For Airmen to progress through the continuum of learning, they must have access to an environment which facilitates their efforts to translate education, training, and experiences into knowledge. This Air Force learning environment is the composite of the conditions, circumstances, and influences that affect the ability of Airmen to progress in the CoL. It encompasses the people, processes, policy/governance, physical environment, organizational environment, and information environment (to include knowledge management) which enable the CoL. This is a complex, dynamic environment influenced by a wide variety of factors. Key learning environment factors shaping this vision include how adults learn, how instruction is delivered, the duration of learning, and other overarching concepts.

How Adults Learn: Adaptive Learning

Adults demand precise, tailored learning that leverages their experiences. This necessitates adaptive learning experiences that provide the right education and training, at the right time, in the right format, for the right effect, for each learner. To accomplish this, the learning experiences for the future must be based on sound adult learning theory, account for generational differences, and continuously refocus on the accessible population.

Learning Theory

Advances in learning science, cognitive psychology, educational psychology, neuroscience, and related fields provide new insights into improved strategies and the application

of technology to learning. Yet years of research show there is still no single strategy that provides the most effective solution to every learning problem. Instructional design strategies and media selection must be based on audience, experience level, learning content, and desired outcome. To achieve this vision, Air Force learning environments must be shaped by sound learning theory that considers goals and purposes, individual differences, and principles for adult learning. Generational differences may yield different approaches to the delivery of learning, yet cognitive learning functions remain consistent across generations.

How Instruction Is Delivered: Technology-Based Learning Opportunities

While technology plays an important role in the global transformation of learning, it is neither a panacea nor the centerpiece—it is an enabler that can be exploited to make learning content more operationally relevant, engaging, individually tailored, and accessible. To make the most of technology as an enabler, the Air Force must (a) employ adaptable and modern instructional design and development technologies that improve the overall effectiveness of the specific learning environment (online or resident), (b) invest in infrastructure and capabilities that support Airman-owned technology without increasing Air Force costs yet meet the call for anytime/anywhere learning, and (c) provide an effective and efficient support environment for students, not limited by technological issues.

A Continuum of Learning

The era of episodic learning is over. Learning in the future must be a continuous, lifelong process which includes a variety of events that complement and reinforce but do not needlessly duplicate each other. The importance of a CoL increases as the pace of change and information flow increases. Airmen must acquire the habits of lifelong learners. They must become expert, self-motivated learners who are capable of asking good questions and who possess digital literacy skills that enable them to find, evaluate, and employ online knowledge, whether in learning or operational environments. As noted previously, Air Force training, education, and experience domains require a holistic integration and clearly defined paths to achieve outcomes at each stage of an Airman's career. The Air Force's learning model can facilitate a CoL culture by encouraging critical thinking and complex problem solving and by providing tools that allow Airmen to access relevant, performance-related information. The Air Force must also augment knowledge available from civilian sources with Air Force–specific knowledge content to reach the total force, including Reserve, Guard, and civilian Airmen.

Faculty and Instructors

Valuing: To achieve this vision, we must produce, reward, and value formal instructor duty as an essential career developmental element for key leadership roles. Instructors should be competitively selected from the very best Airmen. Appropriate instructor courses must be consolidated to conserve resources and improve teaching methods to parallel revised delivery media. Instructors will continue to be a valued resource, which means we should hire only the best-qualified people to train and educate our Airmen.

Developing: To implement this new learning model, we need individuals with three skill sets: (1) faculty and instructors who believe in and are qualified to deliver courseware using leading-edge learning technologies, including collaborative online tools, individualized feedback, social media, web-based educational technology, and the like; (2) instructional system designers who are adept at leveraging the latest technologies to build effective courseware; and (3) a corps of individuals familiar with the tools needed to build technology-based and web-delivered media. Best practices suggest that centralized teams are the most efficient and effective ways to implement this model.

Innovation and a Culture of Cost-Consciousness

We will innovate to create quick, flexible, and adaptable implementations of newer technologies that are also sustainable within our learning environment. We will review and, if necessary, adjust policies that hinder flexibility while still retaining prudent oversight. We will be cost-conscious and always look for increased efficiency and effectiveness. We will fully embrace AFSO21 or Continuous Process Improvement (CPI) from the top down to the bottom up, using CPI as a structured way to decrease cost and rewarding and monitoring appropriate use of AFSO21 events and their results.

Learning Framework

This section describes some of the attributes of the framework for future learning along with actions and results we must achieve to establish the learning vision.

System of Systems for the Learning Environment

First, we should develop an Air Force enterprise-wide learning environment system of systems. We have many stovepipes and different systems now that are expensive and inefficient and do not allow for a comprehensive view of learning. Developing the Air Force learning environment (AFLE) from the current multiple systems will not be easy, and some glass will be broken within various career fields wedded to their current systems. But

we must develop a more integrated approach to delivering and tracking learning for all Airmen: enlisted, officer, and civilian. An Airman should be able to access this AFLE anywhere, anytime. We cannot continue to restrict where Airmen are able to receive learning content. Mobile devices will further expand accessibility to the field, both for learning modules as well as reference materials. Airmen should have ready access to reference material where they need it and when they need it. To achieve this AFLE, we must integrate multiple system developments across the Air Force. Because we expect our Airmen to access learning anytime, anywhere, we must develop more advanced secure online testing methods corresponding to the degree of risk of the course content.

Master Learning Record

One result of this AFLE will be a master learning record (MLR) for each Airman which will, for the first time ever, show that person's entire sequence of learning events from accession through basic military training (BMT) to initial skills training, across all education modules, and also reflect the experiences important to career progression. This MLR will also allow for sophisticated metrics that can be used to tune learning so that we get the best outcome through traceability from job performance back to learning performance.

Less-Restrictive Domain for Learning with Multilevel Security

This learning environment must be supported by a very sophisticated learning management system (LMS). This LMS will be online and reside within an AF.EDU domain, which will be much less restrictive than the current AF.MIL domain yet will provide access restrictions, accountability, and attribution. This capability is a critical requirement to achieve this learning vision. The LMS will store course content so it is always accessible to both current and former students. Additionally, all learning activities for all Airmen will be tracked and mapped in the LMS over their entire career. This will provide guidance for promotion or advancement requirements and for selection to specific jobs. The AFLE will contain the professional networks previously discussed and will also manage the content created by users with a ratings system similar to current online shopping sites. Further, the devices which deliver learning need to be agnostic—that is, work across multiple platforms such as Windows, Macintosh, and the wide variety of mobile devices. We must not restrict access to learning to a particular platform.

Electronic Content Delivery

The AFLE will need to deliver content electronically as we decrease our reliance on paper publications. While acknowledging that certain situations can best be served by such products, we should constantly assess the viability of electronic courseware delivery.

External Cooperation

Finally, this learning framework should include involvement with and participation by a host of external organizations such as universities, private industry, and other governmental agencies. We should work with other agencies to discover similar requirements and work toward cooperative systems.

Learning Governance: Policy Implications

Air Force learning must be more integrated across the service. AETC will leverage the establishment of an education and training core function to accomplish this under the auspices of the core function lead integrator, the AETC commander. Policy must be realigned with this vision. Specific areas to be addressed include Airmen's time, a more innovative approach to learning, and the ways in which professional military education (PME) and the promotion system are linked.

Airmen's Time

We must develop learning policies that provide Airmen the appropriate time to accomplish required learning activities, both during and after duty hours. Implementing a home-station learning TDY status is just one potential concept that recognizes that students who in the past would have attended a brick-and-mortar learning facility require time, unhindered by their normal job requirements, to accomplish the same or a greater level of learning at their home station. Providing time in a manner that delivers benefits equivalent to TDY assignment is the foundation of students' success.

Enterprise-Wide Learning

As AETC forges ahead and implements changes in the delivery of learning, it cannot achieve the full benefit without strong Air Force–wide support. Furthermore, policies and learning methods extending well beyond the reach of AETC educators and instructors will impact the overall effectiveness of a comprehensive Air Force learning program. When future learning is delivered in the isolation of one or two MAJCOMs or career fields, the full benefits cannot be garnered by the Air Force as an institution. Clearly, the implica-

tions of developing supportive policies at all levels are far reaching. Learning changes will impact how we recruit, train, promote, and assign Airmen so that they gain the right training, the right education, and the right experiences at the right time. When successfully implemented, these future learning methodologies will foster a commitment to personal development throughout a career—a commitment by the individual and a commitment by the Air Force.

Professional Military Education and Promotion

PME will leverage the emerging capabilities of distance learning to improve the educational outcomes for the entire total force while increasingly challenging those few officers competitively selected for resident developmental education (DE) to maximize their intellectual growth. Based on the needs of the Air Force and an officer's developmental needs, resident program attendance may occur as intermediate or senior DE or, for some small number of officers, it may include both. But personnel policy should emphasize education for development rather than for stratification. The cornerstone of the proposed policy transition is to strip away some of the multiple "rack and stacks" inherent in the current resident DE selection process and treat DE attendance as a developmental opportunity in the same way as a joint or Air Staff assignment. Through precision, career-long education, officer PME transformation develops the better-educated, better-performing officers required across the total force to meet the demands endemic to the current and future security environment.

Professional Continuing Education

We will continue to focus on innovative ways to deliver professional continuing education (PCE) opportunities. PCE exists to supplement the skills and abilities of Airmen outside the more formalized training and PME learning environments and usually involves courses of short duration. PCE ranges from preparatory courses for new wing and group commanders to human resource management and warfare planning courses and is usually focused on functional or topical learning objectives. PCE is traditionally delivered in residence; however, delivery via distributed means and other more efficient methods will be implemented where appropriate.

Conclusion

As stated in the First Principles, this transformation is meant to deliver learning at the most relevant time in a career, by the most efficient means possible, and with minimal negative effect on Airmen's time. Achieving this vision requires bold action. We must "disenthrall" ourselves of old paradigms. We need to pursue learning methodologies, processes, and organizational change that keep AETC on the leading edge of learning across the full spectrum of command activities. As an Air Force, we must closely examine policies that do not support a healthy learning environment. We accept that specifics of this vision will evolve, but the direction and end state will remain true. We can always develop our nation's Airmen better.

The examples below are merely to illustrate concepts and are not directive. They are intended to show how innovative ideas might be applied practically to various career patterns. There are two parts to each example. One shows the progression of an Airman through that particular training and career; the other includes more general comments about the concepts used for that type of career. The latter appears in italics to differentiate generic concepts from the specific examples.

An Enlisted Civil Engineer Professional Career

The progression of a career enlisted civil engineer (CE) professional will differ from current methodology, emphasizing more self-paced progression through training and placing the right person into the right career field and Air Force specialty code (AFSC). This example uses Chris, a new Air Force recruit, to illustrate how an enlisted CE professional might proceed in the revised force-development paradigm.

Chris wants to join the Air Force. Before meeting with a recruiter, he completes a web-based prescreening interview on the Air Force Recruiting Information Support System–Total Force (AFRISS–TF), hosted in a common environment. The recruiter accesses the interview responses and will meet with Chris to conduct further testing and screening to determine not only Air Force enlistment eligibility, but potential career field aptitude. This screening will include a more-sophisticated Armed Services Vocational Aptitude Battery (ASVAB) personality testing (EQ-i) and medical screening, which the Air Force will proctor, either at the recruiter's office or a local facility. The results, along with his expressed desire for certain jobs, conclude that he is most suited for a career in the CE field (or aptitude area).

Several events occur while Chris awaits the accession date. First, he will undergo more aptitude screening designed for CE-qualified recruits to gather evaluation data and help determine the AFSC for which he is best suited. Secondly, he can begin self-paced computer-based training (CBT) from home on BMT knowledge-only academics and computer security training (IA) via a securely hosted website with password-enabled access. This hosted service will deliver the CBT material, track his progress through the syllabus, and record performance; it is available anytime and anywhere. This system will be the training management system of the future (TMS-F). Curriculum and publication updates will be almost instantaneous because they will be web-based, thus negating requirements to constantly maintain and print changes. Since he will have already completed IA training, the military entrance processing station (MEPS) will issue a CAC card and PIN during in-processing and transmit his electronic shipping package during his one and only trip there.

This vision necessitates a shift of in-processing, screening, and medical reevaluation workload and manpower from BMT to recruiters. It also shifts medical screening and test proctoring from the MEPS to the Air Force recruiting offices.

Once at the BMT site, Chris will use a personal hand-held device to continue self-paced CBT, process paperwork, and receive/read more knowledge-only training material. This mobile device will be used throughout follow-on training. His complete record of training from preaccession screening through supplemental and advanced training and PME—his master learning record (MLR)—will be accessible via the TMS-F and can be used to judge the effectiveness of upstream training, which can then be adjusted accordingly.

The instructor cadre will access Chris's training record through the TMS-F and can provide rewards for completing training ahead of time. During week six of BMT, he will be classified as an electrician, based on preaccession screening data and his performance. He will then report to Sheppard AFB for technical training.

The future accessions process imagines more sophisticated screening procedures during pre-accessions. Based on aptitude screening results, Airmen will be assigned to a "career field family" that is more narrow than MAGE but broader than specific AFSCs and the current GTEP practice. The process will allow for a more scientific approach toward matching the right person to the right job, more flexibility with technical training seat matching, and fewer reclassifications, since AFSC award will occur later in BMT. Preaccession screening will impose appropriate testing development. Whether components of the ASVAB should be redesigned (ASVAB+) or entirely new tests must be developed is yet to be determined. Prescreening aptitude testing and tools will need to be approved by AF/A1.

Technical training will be self-paced as much as possible via the TMS-F. The delivery mechanism will include a more engaging style of instruction, with an embedded "intelligent" tutor to adapt the content delivery and pace to Chris's demonstrated abilities. This will allow him to progress through the curriculum at a pace most suitable to him and help ensure his mastery of the material before progressing. If he encounters difficulty with a particular phase of the academics, the TMS-F will allow him to schedule a one-on-one session with an instructor dedicated to assisting with that particular phase or problem. These sessions and proctored testing will likely be the only classrooms he will need to attend.

Self-pacing will be combined with the current X-week entry cycle to allow students to move ahead if they can accelerate their academic work or proficiency through hands-on tasks and testing. If a student can progress more quickly due to instructor availability, equipment availability, demonstrated proficiency, and/or scheduling, then once that student reaches the level of the most lagging student in the next senior class, that student can advance to the next class. In other words, students progress at their own pace, and if they get ahead of their contemporaries by an amount which aligns them better with the next senior class, they can move to that class.

This mirrors current practice for students lagging behind and will likely relieve some pressure when students are washed back into following classes; a gaining class might also send someone to a different class. This would enable personnel to graduate ahead of time and report early to their operational assignment.

This example describes a self-paced scenario involving an individual in a class environment. Another model might develop two sections within a single course in which one section is scheduled at an accelerated pace. A trainee is assigned to this accelerated section based on proficiency in pretesting or self-paced learning success during the class. In this construct, students are given a diagnostic test to determine who might progress at a faster pace than others, and two different sections are formed for this specific course: one of eight weeks' duration and another of six weeks' duration. If a student is placed in the accelerated track and begins to struggle, that student may be reassigned to the other section which operates at a bit slower pace.

A third example is pure proficiency advancement due to the primary knowledge-based nature of the curriculum and the course, which can be totally independent. In this example, a student with extensive pre–Air Force work as an electrician, who is thus able to demonstrate proficiency in much of the basic course, would be allowed rapid progression and graduation. In all cases, particular specifics of individual courses will require innovative and creative solutions to enable student self-pacing while ensuring that minimum standards are achieved.

Upon graduation from tech school, A1C Chris reports to his first base, Ramstein AFB, as an electrician and attends the First Term Airmen Course (FTAC) within 30 days of arrival. He will be awarded his 5 level after 24 months of on-the-job training (OJT) and completion of his career development course (CDC) while at Ramstein. He then completes the Airman Professional Development Course, which is offered to all A1Cs between 21 and 24 months of time in service (TIS) and is only required at certain bases. He is promoted to SrA and returns to Sheppard AFB to become an initial skills instructor. Before beginning instructor training, he attends Airman Leadership School (ALS) at his 48-month mark.

After graduating ALS, Chris will complete the Basic Instructor Course (BIC) and subject matter qualification in minimum time thanks to the self-paced learning, proficiency advancement, and anytime/anywhere attributes incorporated into training. Since his instruction will have been shifted to a more student-centric, self-paced, online model, the BIC will be reworked to reflect that model and ensure that instructors are well prepared to deliver training in this new environment. Again, his complete MLR is used to judge the effectiveness of upstream training and adjust accordingly. Acknowledging that instructor duty is core to excellence in training, the Air Force recognizes its importance and ensures that this assignment will have a positive career benefit for Chris.

Dedicating 10 hours a week for self-study of the professional development guide, Chris is promoted to SSgt and completes 7-level training with his CDC and 12 months of OJT. He is awarded his 7 level and completes NCOA self-study interactive multimedia distributed learning (DL) and is now an NCOA graduate, earning eight Community College of the Air Force (CCAF) credits.

Chris is reassigned to Patrick AFB and completes lightning protection advanced supplemental training via DL capability enabled by the TMS-F. Hands-on portions of training can, in most cases, be handled at local units with a mix of x/y–CBT/hands-on training which includes eight courses and takes approximately 10–20 days (80/20 knowledge/hands-on) awarding XX CCAF credits. Since SSgt Chris has been out of formal PME for three years, he attends the NCO professional enhancement course.

While at Patrick AFB, he again dedicated 10 hours a week to studying the professional development guide, resulting in promotion to TSgt. If he has 8–12 years TIS or is in the top XX percent of nonselects to E-6 within 8–12 years TIS, he may be selected for NCOA advanced leadership education (ALE), where he may receive three additional CCAF credit hours.

From Patrick AFB, TSgt Chris is sent on a one-year remote tour to Korea and then to McConnell AFB. During his time there, he completes his general education credits required through AU–General Education Mobile (GEM) and is awarded his CCAF degree. He now enrolls in the AU-ABC program and is on his way to completing his baccalaureate degree, which he will accomplish outside of duty hours using tuition assistance.

After another year-long self-study effort of the professional development guide, Chris makes MSgt and immediately attends the SNCO Professional Enhancement Course. Now a SNCO, MSgt Chris begins the Senior NCO Academy (SNCOA) self-study interactive multimedia DL. Upon completion, he is now considered a SNCOA graduate and has earned an additional nine CCAF credits. He completes his 9-level training. At this point in his career, he may or may not be selected for the SNCOA ALE. His selection is contingent upon being selected to E-8 and having 12–16 years TIS or being in the top XX percent of nonselects to E-8 within 12–16 years TIS.

Chris puts in his 10 hours per week over the next year studying his professional development guide. He is now president of the McConnell AFB Top-Three organization and continues to lead his 172-person section of civilians, Airmen, and contractors. As this is reflected in his EPR, he makes E-8.

SMSgt Chris is reassigned to HQ ACC as a functional manager, promoted to E-9, and then completes the Chief's Leadership Course via facilitated distance learning.

A Maintenance Officer Professional Career

Career progression in other AFSCs will also benefit from more self-paced training and other changes cited above. The following example uses Casey, a Basic Officer Training (BOT) graduate, to illustrate how a maintenance officer career might proceed in the revised force development paradigm.

Before meeting with an Air Force recruiter, Casey will complete a web-based prescreening interview and officer application on AFRISS-TF. The recruiter will access Casey's interview responses and meet with him to conduct further testing and screening to determine not only Air Force commissioning eligibility but also potential career field aptitude. This screening will include the AFOQT and more-sophisticated personality (EQ-i) and aptitude testing which the Air Force will proctor, either at the recruiter's office or local facility.

Once the local recruiting squadron commander interviews and decides to recommend Casey for a nonrated slot in the Air Force, he will complete the application in AFRISS-TF and transmit all the required documentation electronically to HQ AFRS. Post selection, Casey will receive medical screening, and the results of the medical and aptitude testing will be provided to AFPC to assist with making a more logical person-to-job match. In this example, AFPC determines he is most suited and will assign him to an Air Force aircraft maintenance career.

While Casey awaits his accession date, he will have the opportunity to begin self-paced study from home of knowledge-only BOT academics and computer security training through CBT via a securely hosted website with password-enabled access. This hosted service will deliver the CBT material to Casey, track his progress through the syllabus, record his performance, and be available anytime and anywhere—the same vision discussed in the previous vignette. Since he will have already completed IA training on ADLS, AFRS can send his personal data to Monterrey so that CACs with certificates can be provided upon arrival at BOT.

Once Casey arrives at BOT, he will use a personal computer to continue self-paced CBT, process paperwork, and receive/read more training material. His complete record of training from preaccession screening through supplemental and advanced training and PME, his MLR, will be accessible via the TMS-F and can be used to judge the effectiveness and adjust upstream training as required. The BOT instructor cadre will access his training record through the TMS-F and can reward him for completing CBT ahead of time. Casey will graduate BOT, receive a commission, and report to Sheppard AFB for the 68-day aircraft maintenance officer course (technical training). Technical training for officers will be self-paced and parallel the technical training vision for enlisted personnel.

In this example, Casey could use embedded intelligent tutors and a live, virtual, and constructive (LVC) environment to accomplish the final "exercise" requirement to graduate, making it possible to graduate ahead of time and report early to the follow-on operational assignment with a 21A1 AFSC.

Casey's assignment, for our purposes, is sortie generation at Shaw AFB, and through two years of hands-on task accomplishment and experiential learning activities, he is awarded a 21A3 AFSC (5-level equivalent). He also completes DL PME requirements, selecting a self-study course on airpower employment and a partially facilitated course on team leadership in the expeditionary environment. Following this assignment, any career will be highly variable but will consist of staff tours, PME, more training, and valuable experiences. In this example, he reports to Osan AB as chief of quality assurance. Casey continues taking DL courses, completing the CGO requirements for promotion to major. He also attends training such as the aircraft mishap investigation course at Kirtland AFB. He will have the opportunity to use distance learning capability via the TMS-F to complete knowledge-only training, thereby either shortening the TDY or negating completely the need to travel. The same principles could apply for his maintenance officer intermediate course since this is mostly a knowledge-only course; hands-on requirements can be accomplished in most cases at local units. He now has an opportunity to finish in minimum time, which better serves both Casey and the unit thanks to the self-pacing, proficiency advancement, and anytime/anywhere attributes incorporated into training via the TMS-F.

Casey applies and is competitively selected to attend AFIT to earn a master's degree in logistics management. After graduation, he is selected for major (but for illustrative purposes in this example not designated a school select) while assigned to the F-16 SPO and pursues certification as an acquisition professional. He also continues to take DL PME courses to meet the IDE requirement, appreciating the flexibility the PME system offers both in course selection and in choosing the appropriate time to take the courses based on life events.

Casey's hard work pays off with selection to command an F-22 maintenance squadron at Tyndall AFB. Though just selected for lieutenant colonel, life as a commander dictates that he take a break from DL education. Luckily, the old days of having to complete DL PME within two years of pin-on to be considered competitive are gone. He does find time for a self-paced course on continuous process improvement which helps him champion a successful AFSO21 effort in the squadron. Casey's senior rater is impressed by his performance as a commander, so much so that he is nominated as a school candidate to attend resident DE and selected by the DT and DEDB to attend ICAF. After school, he returns to the flight line as a deputy maintenance group commander. Over the next three years Casey completes the SDE DL credits required prior to the colonel selection board.

He excels, is promoted to colonel, and finishes a great career as a director at an air logistics center.

A Pilot Career

Undergraduate pilot training (UPT) will be different in the future. The Air Force may migrate to a generalized composite UPT model that incorporates programmatic options to tailor flight training. Future higher-fidelity classification tools will be used to ensure that students track toward appropriate aircraft that better match fifth-generation and advanced modernization mission requirements.

In the future, students will progress from the primary phase in T-6s to the advanced flying phase in the T-X. At some appropriately selected point within the syllabus, the student will "track-select" to a specific track with different associated events. Further classifications will subsequently occur so that students are more closely matched to their final cockpit assignment based on their abilities, their preferences, and USAF rated management requirements. With the introduction of the T-X, many of the skills now taught within the actual formal training units (FTU) will be downloaded to the advanced flying phase and taught in either Introduction to Fighter Fundamentals (IFF) or UPT. IFF will migrate to the later portions of the advanced pilot training phase.

Joint pilot training will shift to a more instructor-focused model. Some instructor pilots will accomplish exchange tours and bring that experience into the UPT environment.

The progression of a career pilot will differ from current methodology, with an emphasis on more self-paced progression and placing the right person into the appropriate cockpit. The following example uses Pat, an AFROTC graduate, to illustrate how a pilot career might proceed in a revised force-development paradigm.

Pat enters ROTC and before her third year takes a revised, sophisticated battery of written and psychomotor tests to determine suitability for a flying career. These tests will include the AFOQT, PCSM, TBAS, EQ-i, and other objective screening tools. If selected for a flying career, she will undergo further screening and evaluation to determine which of three possible career paths she may enter: pilot, combat systems officer (CSO), or remotely piloted aircraft (RPA) operator. Sometime in the last two years of ROTC (once on contract), Pat will attend Introduction to Flight Screening (IFS) for a short flying course which will further evaluate and refine her suitability for a specific flying training path. The IFS program will include training devices and DL attributes that enhance learning immersion and accelerate evaluation tools. This will require careful and up-front scheduling for Pat and likely close coordination between ROTC and the academic institution. For this example, we will assume that she is selected and well qualified to attend UPT.

Undergraduate flying training may transition from the current specialized undergraduate pilot training (SUPT) of today to a more generalized composite UPT by the time the T-X advanced jet trainer is operational. The future UPT construct will provide a common foundation of experience, up to a specific phase of advanced flight training, and then match students to tracks that match performance and Air Force requirements. Since there will be a programmatic progression from SUPT to UPT, we will discuss three phases of this transition: near-term, mid-term, and long-term. For our specific example with Pat, we will describe the near-term experience, which retains use of the T-38 in Phase III training.

To expedite her smooth entry into pilot training, Pat's initial academic training will be provided via a common, securely hosted website. This same site serves as the nexus of her training throughout her career. It will deliver the instructional material, track her progress through the syllabus, and record her performance, and it will be available anytime and anywhere. This system will be the TMS-F described above. The curriculum will be front-loaded with basic academics. There will be much less classroom instruction and much more self-paced progress through the blocks of training. The delivery mechanism will include a more engaging style of instruction with an embedded "intelligent" tutor able to adapt the content delivery to Pat's demonstrated abilities. This will allow her to progress through the curriculum at a suitable pace to help ensure mastery of the material before moving to the next phase. If she encounters difficulty with a particular aspect of the academics, the TMS-F will allow her to schedule a one-on-one session with an instructor dedicated to assisting with that phase/problem. This and proctored testing will likely be the only classroom requirements.

While progress through pilot training will be primarily self-paced, because of track selection and the assignment process, some degree of class scheduling will be necessary. Self-paced study will not be unstructured or unmonitored. It will be combined with the current three-week entry cycle to yield an avenue for students to move ahead if they can accelerate their academic work or proficiency. This approach allows students to progress more quickly, subject to weather, IP availability, demonstrated proficiency, or scheduling. Thus, students can progress at their own pace if they get ahead of their contemporaries by an amount which aligns them better with the next senior class. This mirrors what is currently done with students lagging behind and will likely relieve some resource pressure when other students are washed back. This methodology retains the current group graduation timing necessary to execute rated management requirements.

Minimum military flying-time standards will preserve USAF pilot training's professional credibility and ensure that students receive the proper professional experience prior to the next mission-specific training. This will guarantee that skills and experiences leverage the highly regarded USAF flight training legacy while utilizing the most efficient resources available. For example, more dynamic and realistic flight training will be achieved by taking advantage of

LVC training attributes to expose the students to an immersive learning environment. Traditional group dynamics within a particular class will continue to be emphasized and enhanced to ensure that tomorrow's Air Force professionals build upon the lessons learned from those who have gone before.

As Pat nears the end of primary T-6 training, more sophisticated screening techniques will be used to steer her toward a flying career that is optimized for her abilities and aptitudes. In this example, Pat is selected to the T-38 track. The near-term T-38 track can culminate in any aircraft assignment following pilot training graduation. Because of the demonstrated ability of the T-38 track to provide training to all flying careers, this track will be used to maximum capacity.

Pat will continue to progress through the T-38 track at her own pace and have the opportunity for proficiency-based advancement. At a designated point in the syllabus, students will receive a broad area assignment—either fighter or other. This selection will then determine a specific syllabus which maximizes their training in relevant skills such as crew coordination, tactical formation, and energy management. As the students progress through this "minitrack," they will continue to have proficiency-advancement opportunities. In this example, Pat is selected for the fighter track and flies the syllabus which emphasizes fighter-related skills.

Very close to graduation, which will vary by the syllabus requirements of the respective fighter or other track, students will be assigned a follow-on aircraft. This selection will be based upon the best match between their demonstrated aptitudes and Air Force needs. Thus, students in other tracks may graduate earlier than students in the fighter track if the syllabi are significantly different.

If a student advances within the normal syllabus due to proficiency such that minimum required flight hours will not be reached, extra sorties commensurate with that student's final assignment must be flown. Pat is selected for an F-16 assignment and completes pilot training by concentrating on skills required in that mission aircraft.

The T-1 track will be managed with similar proficiency-advancement opportunities and assignment determination, followed by mission-specific training. Students progressing more quickly through the syllabus will be required to fly additional mission-focused sorties to attain the minimum time for experience and airmanship. An option exists to move students in the T-38 "other" track into the T-1 to provide for more-specialized skill training.

During the transition period to the T-X deployment, there will be three possible pilot training constructs:

- *Specialized using the T-6 in primary and the T-1 and T-38 in advanced, but with increased capacity used in the T-38 (near-term)*

- *Composite generalized using the T-6 and T-38 with multiple minitracks (midterm)*

- *Composite generalized using the T-6 and T-X with a variety of minitracks to match mission types (long-term)*

A midterm approach to pilot training will occur as the T-X is brought on board. The Air Force pilot training system will gradually transition to a single composite tracked system using the T-X as the advanced trainer for all students. Since the deployment of the T-X will be a long-term phased approach, the syllabus will vary by aircraft availability. As the T-X is introduced, T-38s will consolidate at other pilot training bases to increase local capacity. When this occurs, the number of students sent to the T-38 track will gradually increase as the concurrent capacity increases. Eventually, that particular base will be flying a single track construct using the T-6 and T-38. This will provide the most common high-speed exposure to the most students to tailor selection for a successful flying career. This also allows for increased growth in fighter pilot production to meet the CSAF directive and F-35 training requirements.

The aging T-1 will eventually be phased out, negating the requirement to replace it as a training system. At this point, the Air Force will transition to a composite generalized pilot training system providing a common core of high-speed and task-management experience, ensuring that the right pilots are matched to the right cockpit, providing the most near-term/far-term assignment flexibility, and maximum force structure agility.

Near the end of pilot training, Pat will enter the IFF phase of training. This will be similar to the current program, but with an increased emphasis on self-pacing and proficiency advancement. Academics will primarily be delivered via self-paced CBT with instructors available for mentoring, all using TMS-F.

As the T-X is introduced, an expanded IFF syllabus can aggressively download basic flying training unit (FTU) tasks and introduce them in a more cost-effective aircraft. This can help reduce the cost of training in the follow-on fighter FTUs. As a result, the FTU will be able to increase velocity within that particular syllabus or enhance the capabilities of the FTU graduate. Both options will be closely coordinated with the gaining operational communities.

Pat knows that the Air Force expects all officers to pursue education via distance learning as part of their professional development. She needs to earn at least four PME credits prior to promotion to captain. Logging onto the Spaatz Center's officer PME portal, Pat has access to self-study courses and fully facilitated courses that lead to a master's degree.

One of the two-credit self-study courses on "supporting the fight" provides enriching information regarding maintenance issues. She takes advantage of this adaptable access capability and downloads the course to a laptop to complete it during some "down" time.

After UPT, Pat will proceed to Luke AFB for training in the F-16. At Luke, proficiency advancement will still be possible, as well as the self-paced student-centric academic model used previously in pilot training. Additionally, LVC training will be a force multiplier for advanced scenarios. LVC will allow her to fly sorties with live aircraft (other F-16s) against virtual adversaries using simulators, as well as computer-generated constructive entities. Thus, it would be possible for her live two-ship sortie to fly training sorties against another live two-ship sortie with the addition of an appropriately challenging scenario composed of virtual and constructive entities. This LVC-enabled environment will enable her professional capabilities to better match the needs of the operational commanders. In addition, LVC allows for increased training iterations while actually reducing the resources required to produce the same level of proficiency. This will have a commensurate positive impact upon operational units due to a more expeditious upgrade to mission-ready (MR) status. Training will further take advantage of LVC capability to improve mission briefings, debriefings, and student performance assessment.

Following training at Luke, Pat will proceed to an operational unit at Misawa Air Base and progress through normal fighter professional advancement by completing mission qualification training to become MR. Follow-on upgrades will include two-ship/four-ship flight lead, mission commander, specialty mission qualification, and possibly operational instructor. Aspects of each of these programs will include web-based common academics and tactics instruction with enhanced training cues. These formal upgrade programs will transition to use the common Air Force TMS-F, so that she is building a complete record of training.

Analysis of data from this MLR can be used to judge the effectiveness of upstream training, which can then be adjusted accordingly. Living in Japan, Pat also takes a two-credit PME self-study course on cross-cultural communication, which provides direct positive impact with host-nation pilots during a large force exercise. This also completes her basic developmental education (BDE) DL requirement.

At the normal rotation point, for this near-term example, she is reassigned to AETC to be a T-38 IP. En route between Misawa and Randolph, she attends SOS in-residence. This reduces mission impact and avoids requalification training to the combat organization. Pat enters pilot instructor training (PIT) at Randolph AFB following the self-paced, student-centric, proficiency advancement model. Her experience in the F-16 allows adaptive progression during PIT. She completes PIT and proceeds to Laughlin AFB to serve as a valuable T-38 instructor. Her recent experience also provides foundational input to the

eventual beddown of the T-X at Laughlin. As testament to the fact that instructor duty is core to the Air Force mission, this assignment has a positive career benefit for Pat.

Knowing that a master's degree is key to being competitive for promotion, Pat decides to pursue the leadership track of Air Command and Staff College's (ACSC) online master's program. This will also satisfy most of the PME requirements for IDE. It is a big commitment, but she believes the online master's program (OLMP) has a higher professional payoff than an MBA since it is directly applicable to being an operational Airman. Most other captain IPs at Laughlin are also working on degrees. The Airmen agree to cooperatively deconflict their course schedules so they can all complete their operational and educational tasks in time for the O-4 selection board. Wing leadership is involved in this part of the process to maximize the use of Airmen's time, leveraged with a flexible Air Force learning system.

The news that the Air Force designated Pat as a school-select after the major board is cause for celebration. The designation will remain permanently in her career record. This designation indicates that Pat will attend a developmentally appropriate resident program that coincides with the needs of the Air Force when the timing is right. Since she has completed the OLMP, Pat's commander vectors her to another operational tour rather than in-residence ACSC. Pat completes F-16 requal training at Kelly ANGB and reports to Shaw AFB for a three-year tour. This assignment includes duty as an instructor, assistant operations officer, and chief of stan/eval. During this time frame, she completes the four remaining DL courses necessary to earn JPME Phase I credit and complete IDE DL requirements.

Having done well at Shaw, Pat is sent to HQ ACC to work in the F-16 requirements branch. She decides to take additional DL courses regarding the DOD planning, programming, and budgeting system. This results in outstanding performance during the staff tour and a subsequent promotion to lieutenant colonel. Pat receives additional responsibility as a result of the promotion and begins working closely with counterparts on the HAF and combatant commander staffs. She pursues DL courses that are both interesting and applicable to the everyday professional issues confronted by an effective staff officer. Pat also completes DL PME requirements for SDE by completing courses on strategy development and leadership. These courses prove to be particularly useful in the day-to-day performance as an emerging USAF senior leader. During this time, she successfully screens for squadron command.

After the staff tour, Pat returns to PACAF as a squadron commander at Kunsan AB. Following a successful command tenure, she is vectored to Air War College in-residence. Her operational leadership, staff experience, and DL credentials enrich the professional peer interaction encountered at Air University.

After AWC, Pat returns to fly as a deputy operations group commander. She is selected for colonel, competes well at the command selection board, and is matched to command an operations group. After this command tour, Pat is assigned to the Joint Staff J-3 division. She continues taking DL courses, enhancing Air Force leader performance.

The following figures illustrates a typical learning pattern for Air Force enlisted and officer personnel: