

PROFESSIONAL MILITARY EDUCATION FOR LIFE (PME4L)

ABSTRACT:

Professional Military Education (PME) is imperative to developing innovative leaders. It provides Airmen the foundational education required for the Profession of Arms, as well as exposure to new ideas and career fields. Due to PME's importance in an Airman's career development, PME should be a continuous process with the current PME courses as anchors. PME4L complements traditional Air Force PME and invests in Airmen at all levels. This paper presents a Continuous Education (CE) model, powered by the PME4L architecture, and presents the timeline for implementation. The PME4L architecture includes: current architecture needs, learning tools, wiki models, crowdsourcing, and learning management systems.

PME FOR LIFE: EVOLVING PME INTO CONTINUOUS EDUCATION

Air Force Professional Military Education (PME) is foundational to intellectual superiority in today's dynamic, expeditionary environment. Air Force leaders must exceed basic technical proficiency, being continually educated in the areas of warfare and profession of arms, leadership and communication, and national security. Over the course of a career, an Airman will receive between two months to two years of formal PME, either in-residence or via distance learning. The inherent value of PME and senior leaders' emphasis on professional development begs the question: why are Airmen afforded so few opportunities to engage in official, meaningful PME?

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Air University describes Air Force PME as a Continuum of Education,¹ offering a pillar course to serve each of three distinct phases of an Airman's career. For the enlisted corps, Airman Leadership School and the NCO Academy make up the Primary Level, Senior NCO Academy for the Intermediate Level, and the Chief Master Sergeant Leadership Course at the Senior Level. For officers, Squadron Officer School is the Primary Course, Air Command and Staff College at the Intermediate Level, and Air War College for the Senior Level.² Because these pillar courses are offered at individual touch-points in a career, the educational value is limited by the confines of course participation. To this point, once a student is graduated or dis-enrolled from a course, they lose access to the repository of lesson materials that would otherwise enable future individual study and unit-level instruction.

The issue is more profound than inaccessible course materials. The Continuum of Education model only reaches Airmen at critical junctures, leaving the majority of professional development to training and experience. As opposed to PME, these two pillars of Air Education and Training Command's (AETC) Continuum of Learning are constant throughout an Airman's career. The value of PME is its focus on teaching Airmen *how* to think, which greatly enhances both training and experience. For this reason, PME must become a regular staple in the professional development of all Total Force Airmen.

Adding new PME requirements to Airmen's already overloaded lives is not the answer. Balancing work requirements, deployments, personal education, mission training, computer-based training, families and personal time is no small challenge. In fact, Air University's current

¹ Air Command and Staff College, "About Us," <http://www.au.af.mil/au/acsc/about.aspx> (accessed 8 December 2014)

² Air Force Instruction 36-2301, *Developmental Education*, 16 July 2010

PME Transformation initiative is actively seeking areas to give time back to Airmen, families and units. As a natural step in the PME Transformation effort, Air Force PME should evolve into a Continuing Education model, similar to that used by millions of civilian credentialed professionals worldwide.

THE CASE FOR CONTINUOUS EDUCATION:

As a critical element of the United States' armed forces, the USAF is a profession of arms. Serving as a profession of arms requires instilling and maintaining a professional culture throughout the force. Currently the Air Force strives for this acculturation and development in numerous ways, from the curriculums of initial entry training to regular reinforcement of the core values to the Airman's creed. The most formal method of this development is through the Professional Military Education (PME) system, in which airmen of all types are removed from their daily operational environments and 're-blued' through standardized, cross-Air Force education which refines their core warrior competencies across the full arc of their careers. While military service is a special trust, it is not the only one which the public holds to a high standard of professional conduct; doctors, lawyers, educators, and police officers exemplify a broad category of professionals who are expected to meet a high bar of education, training, and performance. These fields address the challenge of career-long improvement, currency, and development through Continuing Professional Education (CPE). CPE is an all-encompassing term for a broad spectrum of learning activities and programs. These activities and programs are designed to bridge the gap between being skilled and proficient in a specific task to being part of a larger community and profession. CPE creates this professional community by focusing on learning throughout the professional's career.

Three main objectives for an individual's participation towards CPE are generally work-related goals: 1) Continue to remain employable, 2) Transform occupational role and 3) Seek advancement and promotion.³ The mechanism for implementing CPE, awarding Continuing Education Units (CEUs) is a standard practice in formal professional communities. Although individual professions have different standards, the most widely accepted standard, developed by the International Association for Continuing Education & Training (IACET), is ten contact hours equals one CEU.⁴ CEUs ensure professionals maintain currency on their skills and are always learning and keeping current with the latest trends and developments in their chosen profession. Gardner *et al.* suggests to some registering authorities mandatory CPE in order to protect the public from incompetent practitioners, drawing a link between continuing education and clinical competence.⁵

The current Air Force professional development model for the force as a whole is far from reaching the breadth and systemization of the CPE approach. The primary vehicle for career-long development as professionals of arms (versus career field specific development) is the PME system. However, infrequency in our current model does not offer a lifelong continuum of learning throughout an Airman's career. Enlisted and officer PME courses are treated as momentary touchstones throughout an Airman's Air Force journey—shared experiences at strategic points in a career. Oftentimes meaningful lessons are learned, only to be forgotten again until the next step of PME at some distant point in the future. Momentum is lost, and operational requirements fill in the intellectual void. This system of occasional “touches” causes the force to

³ International Association for Continuing Education and Training, “About the CEU,” <http://www.iacet.org/ceu/about-the-ceu#> (Accessed 8 December 2014).

⁴ *ibid.*

⁵ Davis L. Gardner, Ronald J. Seymour, and Warren E. Lacefield, “Mandatory continuing education or periodic re-examination?” *Physical Therapy* 61, no. 7 (1981): 1029-1034.

lose significant resources immediately following graduation from a course. Students lose access to their online learning environments, full-scale professional networks are lost (except for some maintained through personal contact), and students wait for many years before re-encountering the educational environment, allowing gains to atrophy. Further, the system is one-size fits all, as all personnel, regardless of personal developmental experiences or outside education, are forced into the same learning requirements in order to advance within their professional military careers.

The Air Force embracing a continuous educational model which integrates CPE concepts in order to persistently develop professional Airmen, engages the member with the force throughout their careers. PME4L will retain current pillars of PME, such as SOS, AWC, and NCOA, but implement mechanisms to bridging the gaps and seams between courses. A continuous system allows Airmen to custom-guide their professional development based on personal learning styles and individual career situations, readily leveraging the resources gained in PME courseware anywhere, anytime. This model provides long-term opportunities to transition PME to a CPE system, in which different educational experiences could be credited towards progression in PME. As core leadership competencies develop, eventually these would translate into managerial units/credits, crediting towards their professional requirements.

Implementing a continuous education model across the Air Force will require the creation of a continued learning environment that leverages readily available technology and is persistent across PME courses to provide life-long access for Airmen to reap the full benefits of PME. The remainder of this paper discusses the concept of such an environment as well as the required infrastructure, a timeline for development, and an implementation plan.

PME4L ENVIRONMENT:

PME for Life (PME4L) is an actionable concept for the evolution of education. It is a platform designed to fuel innovation, foster learning, and enable efficiencies. The PME4L system provides an environment for continuous education throughout an Airman's career. Utilizing the model of centralized management and decentralized execution, the platform is a standardized learning platform service-provider for the Air Force PME schools. Consolidating all of the PME schools into one cloud-based service platform dramatically augments the ability of the schools to ensure consistency, access, usability, and interoperability at any location and at anytime.

Centralized management removes the administrative burden from each PME institution for managing its electronic educational architecture, instead providing a simple and easy place for schools, faculty, and students to conduct standard learning management functions. These basic functions include file sharing, discussion boards, and assignment submission, based on state of the art technology to automatically and intuitively structure information. Rather than requiring each school to separately buy and operate a system which provides these functions, they operate through the PME4L program office, allowing schools to simply access and update their sections as needed. This environment is also the location for providing additional collaboration tools, such as a PME-wide Wikipedia, polling functionality, and social networking.

While the system will be centrally managed on a technical level, educational implementation will remain decentralized. Schools will be able to choose how and when they use file sharing, social networks, wiki-systems, and other systems in order to implement their particular curricula. Regardless of how each school chooses to implement, students will always have access to course information by virtue of the single lifetime logon to the Learning Management System (LMS).

Airmen can always access the latest versions of their accomplished and in-progress courses as well as the content in the AU Library.

This LMS revolutionizes how Airmen access, consume, and discuss PME content. The platform will allow a field grade officer to pull up their journal entries from SOS prior to mentoring a new captain, allowing the FGO to remind him or herself of their concerns at that point in development. A squadron commander can access the social network from her ACSC class to discuss unit challenges with her peers; and a general can open a forum for selective or open Airmen communities to ask questions and propose ideas.

PME4L will allow students to access information in ways suited to their learning styles; one student might elect to conduct an in-depth review of all course readings while another discusses the reading's concepts in a discussion board shared with ACSC students, while a third chooses to compose Wikipedia entries on the subject based on researching outside information. As students progress through PME across their careers, they will be able to stack and fuse these experiences, easily referring to their previous work as they move forward in later educational situations. Because this information will be persistently and easily available, that educational experience will not be limited to the formal in-residence portion of learning. Instead, Airmen will be able to choose how they engage with PME. including participation in recurring think tanks remotely from their home stations or contributing leadership lessons via video recordings similar to those found on TED Talks.

PME4L TOOLS:

Learning tools are layered into PME4L based off of individual course requirements. This is applied in a similar methodology to Massive Open Online Courses (MOOC) such as Coursera

and EdX. These systems provide the standardized framework and tools which allow for course providers to educate in a collaborative and interactive online environment. The critical tools implemented in PME4L are modern LMS, wiki and crowd sourced learning, and learning analytics. In addition the PME environment is adaptable to allow for the inclusion of emerging technology as it is developed and meet all cyber security requirements.

LEARNING MANAGEMENT SYSTEM:

A pivotal step in the transition to the PME4L system is the selection of a flexible and easy to use learning management system. Currently, Air University employs Blackboard for their LMS requirements. However, current research and educational trends point to Canvas by Instructure as the best option for PME4L. Canvas is an open-source, cloud-based LMS that has been adopted by more than 600 education institutions throughout the country, including Auburn University and the University of Texas.⁶ In their 2011 study which selected Canvas, Texas highlighted its simple and intuitive interface, excellent customer support and improved avenues for collaboration as a few areas where Canvas set itself apart from its other LMS competitors.⁷

To these ends, Canvas offers a clean and intuitive user interface. It also supports mobile accessibility with free, full-featured mobile apps available for both iOS and Android.

Additionally, it provides a calendar tool that aggregates due dates, events, tasks, and personal appointments. Canvas' calendar feeds can be imported into Google Calendar, iCal, and MS Outlook. Canvas supports real-time collaboration with two-way communication between instructors and students using text, video, audio, and document file attachments and allows

⁶ Instructure, "Stories from Higher Education," Canvas by Instructure, <http://www.instructure.com/higher-education/stories> (accessed 7 December 2014).

⁷ Jennifer Jobst, *Course and Learning Management System Project Report and Recommendations*, (Austin: University of Texas, 1 July 2011).

faculty and students to configure their notification options to integrate with services such as Facebook, Twitter, and text messaging.

In addition to the universities already noted, other public institutions have begun to adopt Canvas. The Washington State Board of Community and Technical Colleges selected Canvas in 2012 to be the base for its statewide distance learning system. This decision has influenced other public schools within Washington to transition to Canvas as well.⁸ Perhaps most critically, Canvas has a growing stake in the civilian education arena, ensuring a stable and relevant platform for the future.

In the modern environment of financial uncertainty and austerity, it is important that the LMS selected for PME4L be economical and cost effective. In a 2013 study conducted by University of Alabama at Birmingham, they determined that after its first year net cost of \$107,800, Canvas would save the university \$157,620 per year over what they would pay for Blackboard. This was a key element to their adoption of Canvas over Blackboard, which was implemented in 2014.

WIKI-PAGES SYSTEM AND CROWDSOURCING:

As the overarching framework for facilitating lifelong USAF PME, the PME4L LMS will leverage the collective contributions of Airmen through crowdsourcing. This will revolutionize how PME concepts are learned and discussed, thereby democratizing leadership learning for all Airmen. The crowdsourcing method facilitates peer collaboration through the sharing of Airmen's expertises, experiences, and insights. Online collaborative wikis and crowdsourcing communities achieve highly effective peer collaboration by connecting all users in a community

⁸ John Farquhar, *The Canvas LMS Recommendation* (Bellingham: Western Washington University 11 January 2013).

together and giving them each a platform to add their piece to the conversation. PME4L will give every Airman a voice, allowing the organic creation of a common Air Force narrative that will transcend generations.

A wiki model is a reference database written collaboratively by the user community with the oversight of a privileged moderating community. All users have the ability to add, modify, or delete content through a multistep peer review process. This bottom-up approach to knowledge management encourages Airmen to provide information on topics that are relatable and easy to understand for other Airmen. PME4L's "Wiki-PME" database will function as a PME-wide persistent and "living" encyclopedia that will encourage student collaboration and sharing of knowledge and experiences. The database provides the framework for linking content across all mediums within the LMS, allowing a full-scope searchability and citability by enforcing information cohesion. Airmen attending PME will produce a majority of the content, to include leadership case studies, doctrine applications, career-specific information, and professional and educational experiences. Collaborative input can also be provided outside the formal PME construct. Policy writers at the Air Staff, functional managers, educators across AETC, and operational Airmen can all contribute to the PME4L Wiki-PME database. Since the Air Force lacks a unified information sharing platform, the Wiki-PME can serve as the foundation for knowledge management for Airmen to access and benefit from throughout their Air Force career.

A crowdsourcing community model is similar to an online bulletin board in which users of the community post content (e.g., stories, questions, comments, links) for the community to read. Community users can add comments to the content discussion and cast votes on the quality of the content by upvoting and downvoting. The cumulative amount of upvotes and downvotes on an individual piece of content determines the position of the content on the bulletin board.

Through this voting process the content is effectively curated, in which the most valuable content (as determined by the community) rises to the top of the page while the least valuable content falls to the bottom. This model is incredibly effective at curating and sorting the most valuable content from all user submissions, cueing senior decision-makers towards community interests. Senior officials and organization can create temporally-constrained user forums for question and answer sessions commonly known as Ask-Me-Anything, or AMAs. Such systems and methods were pioneered by Reddit.com, one of the top 50 most popular websites on the internet today.

LEARNING ANALYTICS:

Learning Analytics is a new concept in education that has become increasingly popular within the past five years. The 2013 Horizon report defines Learning Analytics as a "Field associated with deciphering trends and patterns from educational big data, or huge sets of student-related data, to further the advancement of a personalized, supportive system of higher education".⁹

Many institutions of higher learning are using analytics as a tool for both faculty and students to improve education. The Learning Management System, Canvas, has released Learning Mastery for Students, which allows students to follow their progress in the classroom and identify areas of improvement. PME4L can use this application to track how students use the learning materials, how they participate in discussions, the timeliness and accuracy of assignments, and the overall academic performance. Quiz Stats is another Canvas feature that identifies trends in how students interpret and answer questions posed by the instructor. This allows the faculty to note any misleading or ambiguous questions and also see the range of how questions were

⁹ L. Johnson, L., S. Adams Becker, M. Cummins, V. Estrada, A. Freeman, and H. Ludgate, *NMC Horizon Report: 2013 Higher Education Edition*, (Austin, Texas: The New Media Consortium 2013), <http://net.educause.edu/ir/library/pdf/HR2013.pdf>.

answered. Such capabilities helps teachers improve the effectiveness of tests and discussions.¹⁰

USER PROFILE MANAGEMENT:

Utilizing a crowdsourced model, it is important that the user's virtual persona is depicted and managed in a manner that reinforces their desire to contribute. Research into the driving factors motivating people to participate in social networks "...identified that the satisfaction of the needs for belongingness and the esteem needs [Maslow's Hierarchy of Needs] through self-presentation together with peer pressure are the main drivers of participation. The analysis of a sub-sample of active users pointed out the satisfaction of the cognitive needs as an additional participation determinant."¹¹

The PME4L LMS includes a robust profile management system that will allow Airmen to view in one location all of their contributions across the crowdsourced mediums in addition to their traditional and continuous learning PME accomplishments. The social network for professionals, LinkedIn.com, provides similar robust profile management capabilities since the user's profile is essentially a virtual resume. As the LMS matriculates and the Air Force PME culture evolves to incorporate continuous education, the user profile will begin to be viewed as a career resume as well.

Additionally, the PME4L LMS ensures that contributors operating under a public profile are recognized for their accomplishments and contributions, thus implementing a positive feedback cycle promoting quality content generation. Users wishing to exercise the non-attribution associated with academic freedom can choose to contribute anonymously with the oversight of moderator community. Additionally, users who wish to self-identify contributions made

¹⁰ Joshua Bolkan, "Instructure Updates Canvas to Bring Analytics to In Person Instruction," *Campus Technology*, 19 June 2014, <http://campustechnology.com/articles/2014/06/19/instructure-updates-canvas-to-bring-analytics-to-in-person-instruction.aspx>.

¹¹ Krasnova, Hanna, Thomas Hildebrand, Oliver Guenther, Alexander Kovrigin, and Aneta Nowobilska. "Why participate in an online social network? An empirical analysis." (2008).

anonymously can do so, this allowing the benefits of both contribution methods.

EMERGING TECHNOLOGY:

Given the ever-evolving nature of technology, it is critical PME4L remains adaptable and capable of incorporating newer features. These emerging technologies may include virtual reality, immersive video conferencing, and educational gaming. This capability ensures enduring effectiveness for the PME4L model.

CYBER SECURITY:

PME4L is vulnerable to cyber exploitation and attack like any other system that is connected to the internet. PME4L was developed with security in mind leveraging National Institute of Standards and Technology (NIST) and applying them to a cloud architecture. The NIST guidance was published and provided to support the Federal Risk and Authorization Management Program (FedRAMP) which focuses on security for cloud computing. The FedRAMP program assesses the following baseline security controls: risk, security, data, privacy, monitoring, and incident management. Since PME4L will contain information about current education and leadership personnel, to include Personally Identifiable Information (PII) about the user, specific government requirements need to be met.

The cloud provider must meet FedRAMP approval, have the ability to virtually separate data of other government network systems, and ensure data is accessible on-demand. Currently, Amazon Web Services (AWS) is approved to meet these requirements in addition to supporting level 3 and 4 government data that is considered sensitive but unclassified. Besides cloud security, PME4L software must also implement cyber security measures.

PME4L software will be accessible via an online user interface from any type of device, and

must be secure from password attacks, cross-site scripting, structured query language injections or other vulnerabilities. The first step in securing PME4L is ensuring that it is only accessible via the Air Force Portal and utilizes middleware to allow for system authentication with the portal. Additionally, PME4L will utilize its own certificate authority and implement Secure Socket Layer (SSL) type encryption to ensure data is encrypted during transmission. PME4L and its cloud infrastructure will meet the Defense Information Systems Agency (DISA) strict adherence to approval with an Authority To Operate (ATO).

INFRASTRUCTURE REQUIREMENTS:

The lynchpin for the PME4L architecture is the ability to provide a robust infrastructure, capable of supporting all intended uses. Infrastructure includes not only the electronic devices that users interface with, but more importantly, the telecommunication networks that create a framework for devices to integrate within. The network provides the foundation in which all future technological advancements will operate. Armed with a robust network infrastructure, today's education models are able to utilize engaging, media-rich contents, and allows real-time interactions and collaboration. According to a recent article by the eLearning Industry, schools and learning are "bleeding beyond time and place and are no longer confined to a university campus or a particular set of hours."¹² Improved communication and technology devices are at the very foundation of the learning process for today's "Information Generation."

In 2012, the State Educational Technology Director's Association (SETDA) released their recommended infrastructure requirements designed to enable educational institutions to function in the present and near term demands of learning. Based on their work and collaboration, the

¹² Mary Burns, "The Bandwidth Schools Have and the Bandwidth They Need," ELearning Industry, 10 November 2014, <http://elearningindustry.com/bandwidth-schools-bandwidth-need>.

minimum bandwidth recommend for the 2014/2015 school year, for grades K-12, is a 100 Mbps connection to an outside internet service provider (ISP) and a 1 Gbps internal wide area network per 1000 students and staff.¹³ This requirement will climb to 1 Gbps external to an ISP and 10 Gbps internally to a WAN in 2017, with all instances supporting 1000 students and staff. There is a growing realization that connectivity will be paramount to future learning and collaboration, and without the proper investment into infrastructure, none of the desired learning initiatives, to include PME4L, could be achieved.

The current Air University network infrastructure at Maxwell Air Force Base is inadequate to support the PME4L architecture. The infrastructure is incapable of providing the appropriate bandwidth necessary for modern learning styles and education constructs. The infrastructure in the classrooms of the Squadron Officer College is based on “wi-fi hotspots”, connected to a local cellular network. Not only are these hotspots in place as a short-term, stop-gap solution, but they are also limited in the number of connections, bandwidth, and data usage. The internet connection in lodging facilities is markedly better than the SOC campus network, however it is still constrained to estimated upload and download rates of 275 Kbps – 1 Mbps. These speeds are approximately 1,000 to 4,000 times less than what the SETDA recommends for institutions that wish to incorporate basic online, blended educational methodologies.

The implications of the current degradation of existing Air University network capabilities become clear when examining the impact on Squadron Officer School students during their time at in-residence PME. Currently, all course material is accessible only through the Blackboard

¹³ Christine Fox, John Waters, Geoff Fletcher, and Douglas Levin, “The Broadband Imperative: Recommendations to Address K-12 Education Infrastructure Needs,” (Washington, DC: State Educational Technology Directors Association (SETDA), 2012).

learning management system, which creates a bottleneck every day due to overloading of the network. In fact, during a survey incorporating a sample size consisting of 16% of SOS class 15A, students reported spending 12.5 minutes daily downloading files from Blackboard. Over the course of a 5-week class and with a student population of approximately 700, students lost over 3,500 man-hours on downloading courseware so they could accomplish their assignments. Since the SOS campus network is so limited, this results in 96% of students accessing online material in their dorm rooms while no one is able to access school materials inside the school itself¹⁴. The students are having to prioritize their workload and schedules based upon these network constraints, and it is impacting the learning occurring within Air University. The SOS student body would dramatically reduce lost man-hours due to bandwidth inadequacy and unnecessary downloading times. The immediate benefits of simply bolstering the network infrastructure to be able to handle increased bandwidth would be multifold. PME classes will be able to utilize the media-rich learning environments. Additionally, it provides the backbone for the PME4L architecture. Without improved network infrastructure, however, the serious benefits of technology will not be leveraged in an effective manner.

In addition to the limited network capabilities, it is important to note that nearly 100% of SOS students are bringing their own technology solutions and computers when attending PME. There is an incredible opportunity that exists within the school where they could tap into that collective power. In the 15A class, 93% of the student body brought their own devices because the reporting instructions “highly encouraged” students to bring them. By encouraging a “bring-your-own-device” policy, a level baseline could be established that enables further collaboration and learning amongst students. Understanding every student may not have their own devices is important, but home stations usually are able to lend machines, and Air University could

¹⁴ This information is based on a survey of 16% of the approximately 700 students in Squadron Officer School, class 15A, November 2014.

supplement with a few devices for rental. This would be another method to ensure every student has the tools and access necessary to enable a more complete and richer education. With the complicated architecture of the learning management system used at SOS coupled with severely limited bandwidth capabilities, the student body and staff are losing precious man-hours. It is our goal to return this precious time to the future leaders of our Air Force so they can maximize their reflection and leadership development.

Now that we have identified future infrastructure requirements as well as short-falls of the current network, it is important to identify other industries and institutions that have created better systems for their students to utilize. One of the leaders in establishing interconnectivity between different institutions is OARnet, a consortium in Ohio dedicated to providing affordable high speed connections to education organizations, state and local governments, and other public service agencies. Currently they have established a 100 Gbps fiber backbone across the state, and provide 1-10 Gbps to every end user, including Wright Patterson Air Force Base. A similar venture in Alabama would be able to connect the Air University with other colleges and universities, and provide an avenue for potential partnerships for collaboration, research, and cost sharing in the future. There are many opportunities available, but the underlying network needs to be robust enough to enable these prospects.

TIMELINE:

We expect it to take 24-36 months to create the fully functioning system and an additional 10-18 months to fully migrate and implement the system. To acquire and create the capability, we've broken the project into 4 phases.

- Phase 0: Acquisition Requirement (9-12 months) – The first step required will be to identify a program manager and support staff (Engineering, Contracting, Finance, etc.). This program manager will ideally be a member of the 63 career field to ensure they have formal training in program management and acquisition requirements. To ensure initial program success, it is recommended this program manager be located at Maxwell AFB or the Gunter Annex and a member of Air University. The program manager would need to capture and finalize system requirements (3-6 months). From there, a request for information (RFI) would be published on Federal Business Opportunities (FedBizOpps) and commented on/responded to by industry (3 months). Next, a study contract would be awarded to several companies to propose comprehensive solutions and costs (3 months). Finally, these results of this study could be used to down-select to a single company/entity to design and build the PME4L architecture (1 month from study results to down-select). Separate from this contracting timeline, but occurring concurrently, will be the development of a migration plan for PME courses internal to AU.
- Phase 1: Acquisition and Planning (7-10 months) – The initial part of phase 1 allows the contractor to develop and create the system to our specifications. Once created, an authority to operate (ATO) would need to be initiated. Initiation of the ATO is critical as previous ATOs have taken 12 or more months for approval.
- Phase 2: Initial Data Migration (5-8 months) – Phase 2 is an initial release for testing of system functionality and compatibility of Air University material. This testing is for the software functionality and is not intended to test functionality of large number simultaneous users accessing the data.
- Phase 3: Cloud Computing (3-6 months) – The cloud computing phase consists of migrating

the system from a localized, small scale system, to cloud computing. A cloud based system is required to support a large number of simultaneous users at geographically diverse locations. This phase is not intended to open use for the larger populace, however it would allow for training and familiarization of the multiple modules with Air University Staff and the necessary support personnel.

- Phase 4: Implementation (10-18 months) – To minimize the impact of live training, we intend to phase implementation as well. By phasing implementation, it for improved organization and carrying on of lessons learned. Additionally, it gives time for Air Universities' geographically separated units (i.e. Airmen Leadership Schools, Non Commissioned Officer Academy) to ensure the proper infrastructure required to support this new functionality. Implementation will begin with in residence courses, then spread across the Air Force in an organized manner by slowly opening PME4L to different user groups.

IMPLEMENTATION PLAN:

PME4L requires a 4-stage approach to allow for testing and documentation prior to full implementation. Implementation starts at Phase 4 of the acquisition plan, and will take approximately 8-14 months to deploy Air Force wide from the completion of acquisition. The stages of roll out are dependent on technology and previous testing, to ensure the system is appropriately tested and implemented per specified requirements.

- Stage 0 is the implementation of PME4L within one program such as Squadron Officer College. This stage would allow for beta testing, additional documentation to include updating Air Force Doctrine, feedback, and recommended corrective actions to further implement in future stages. The expectation is to complete Stage 0 in 1-2 months and plan for a further rollout to all Spaatz Center courses to include Air Command and Staff College

and Air War College.

- Stage 1 is expected to encompass all officer PME, to ensure the system is rigorously tested and further refined to meet the additional PME requirements in residence and through continuous education. Upon moving from Stage 1 to Stage 2 in approximately 2-3 months, the system would be considered Initial Operating Capable (IOC) and be set to launch within other Air University environments.
- Stage 2 will implement PME4L to support enlisted PME under the AU construct. This stage requires additional capability, infrastructure, and PME point of contacts since some enlisted courses are at satellite locations outside of Maxwell AFB, AL. This stage will implement the distributed model of PME4L and stress test the robustness of the cloud based architecture. Stage 2 will require additional time of approximately 3-6 months to fully execute and test to ensure that the PME4L architecture is properly configured to meet the demands of numerous bases, personnel and PME courses accessing the content. Upon completion of Stage 2, PME4L will be considered Fully Operational Capable (FOC) and rolled out to the remainder of AU.
- Stage 3 is the employment of PME4L to other AU courses such as School of Advanced Air and Space Studies (SAAS) and Air Force Institute of Technology (AFIT). Stage 3 will take nearly 4-7 months to complete since PME4L will need to alter its content, courseware and delivery to include schools outside of the PME framework. Since PME4L utilizes a distinct framework, it can be tailored for any educational or training program and in Stage 4 it could be implemented Air Force wide within 10-18 months. PME4L should provide Airmen a leadership laboratory to develop, mentor, teach, and become future leaders in the United States Air Force.

CONCLUSION:

PME4L is a cultural change to current Air Force PME models and expands the traditional touchpoints of education into a continuum of learning throughout an Airman's career.

Leveraging existing technologies and layering emerging ones creates a PME community where information flows between ranks, bases, and career fields. This program further serves as a revolutionizing framework for a more collaborative, interactive, and engaging PME experience.

PME4L captures the intellectual capital throughout the Air Force, allows for agile thinking and fuels innovation.