Innovating to Integrate the Intangibles into the Learning Air Force

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ABSTRACT

United States federal law and other regulations require the US military services to provide professional military education to their forces. Meeting that requirement will become increasingly difficult with the absence of a federal government budget, significant cuts to defense spending, and expected future cuts to both defense spending and manpower. Additionally, the operations tempo remains high despite the withdrawal of troops from Iraq and the planned withdrawal from Afghanistan. The resulting time and budget constraints will likely make it more difficult for the services to provide every member with the opportunity to compete for positions in coveted in-residence professional military education programs. Thus, the Air Force is considering a new lifetime learning approach to professional military education. As the Air Force seeks to develop its new paradigm, we must understand what benefits of the current system should be retained and what drawbacks should be allayed. Unfortunately, there is little research in this area. We content analyze data collected from Air Force officers attending in-residence professional military education, synthesize our findings with education and technology literature, and suggest innovative technologies that can maximize the intangible benefits and minimize the drawbacks of professional military education. The blended approach we present can create a richer, more meaningful learning experience for the service member, while simultaneously lowering the cost per member and providing greater opportunity to attend in-residence professional military education.

Military services are required by the Goldwater-Nichols Act of 1986 and Chairman of the Joint Chiefs of Staff Instruction 1800.01D to provide professional military education (PME) to their members. The US Air Force implements this guidance through Air Force Instruction 36-2301. While operating the Department of Defense (DoD) on continuing budget resolutions for the last 4 years may have been challenging for the services, the recently enacted budgetary sequestration requirements have dealt a severe blow to DoD and service expenditures. The reduction in available budget and the coincident personnel cuts threaten to strain the in-resident PME system. The Air Force sees these challenges as an opportunity to evaluate their current PME approach and consider alternatives.

PME is the foundation upon which the Air Force develops competent leaders. It is a critical tool, as is the military leadership education of the other services, in the development of officers capable of executing the country’s National Defense Strategy. In Air Force PME, students learn tenets of leadership, strategy, international policy, and other topics germane to the military profession. Although the content has evolved, the PME model for Air Force officers, a tiered education approach based on rank, has remained relatively unchanged since the birth of the US Air Force from its Army Air Corps origin in 1947. To this end, the Air Force is currently considering a Learning Air Force approach to PME. The Learning Air Force approach adopts a blended learning method, which consists of both correspondence and in-residence learning events. For instance, some courses would be delivered at various times throughout an officer’s career via correspondence methods. Then, officers would attend revised and considerably shorter in-residence courses at specified intervals throughout their careers. Although Air Force leaders are considering the Learning Air Force approach, this blended learning method raises new questions and potential challenges about how changes to the current PME system might impact both the Air Force and its officers.

OVERVIEW

This article offers an initial investigation into the potential effects of transitioning to a blended learning approach by uncovering the intangible benefits and drawbacks of in-residence PME, and then examining ways by which to retain benefits and limit drawbacks when designing a blended learning system. The Background section provides a precise examination of correspondence and blended learning techniques in the context of the Learning Air Force approach. We then provide a detailed qualitative content analytic examination of the
intangible benefits and drawbacks of in-residence PME in the Method section. Surprisingly, this has not been done previously. In the Discussion section, we integrate the research results with a review of extant literature to suggest the adoption of innovative technologies that might help to enable the Learning Air Force concept or enhance the current PME experience via retaining benefits and minimizing drawbacks. Regardless of whether the Air Force retains the existing PME system or adopts the proposed Learning Air Force PME approach, the suggestions we present in this article can be incorporated to provide substantial benefit. Likewise, our recommendations can apply to and be integrated into sister service PME programs.

BACKGROUND

Although the specifics of the Learning Air Force approach are still being developed by senior leaders, there is an emphasis on correspondence learning. As technology continues to evolve and the Air Force becomes more dependent upon its information infrastructure, this emphasis is not only prudent, but perhaps essential. Additionally, problems with replicating education, the number of service members served, and the distance to the education training site diminish with correspondence methods. However, when examining what course content should be delivered to students via a correspondence method, some intangibles associated with attending PME in a strictly in-residence fashion may be lost. In the context of this study, “intangibles” refer to those aspects of attending in-residence PME that are not explicitly incorporated into curriculum, but still affect outcomes from attendance. Examples of such intangibles include expanding one’s professional network or, conversely, losing currency/proficiency in flying or other job functions while attending PME in-residence.

CORRESPONDENCE AND BLENDED LEARNING WITHIN THE LEARNING AIR FORCE

The Air Force transition to a correspondence or blended learning platform offers an opportunity to mitigate current shortcomings of in-residence PME; however, intangible benefits and drawbacks of attending PME in-residence should be considered when designing a correspondence or blended learning PME curriculum. We identify some intangible benefits and drawbacks of the current in-residence and correspondence PME models using analytical methods. Then we posit several suggestions to retain the benefits and minimize the negatives via adoption of innovative technologies.

There are 3 Air Force PME levels for officers: basic developmental education, intermediate developmental education, and senior developmental education. Squadron Officer School is the basic developmental education program that is attended by captains with approximately 6 years of commissioned service. Air Command and Staff College is the intermediate developmental education program that is attended by majors with approximately 12 years of commissioned service. Air War College is the senior developmental education program that is attended by lieutenant colonels and colonels with approximately 18 years of commissioned service. With minor differences at the company grade officer level, Air Force PME roughly equates to the Army, Navy, and Marine Corps programs.

Currently, 2 methods exist for completing Air Force PME. The preferred method is selection to attend PME in-residence, however, there are a limited number of positions for Air Command and Staff College and Air War College. Officers not selected to attend in-residence PME will have to complete the correspondence (known synonymously as distance learning) version of the program. Professional military education by correspondence is accomplished outside of a traditional classroom setting using a variety of different delivery models at the student’s own pace.

The Learning Air Force concept presents an alternative to the current paradigm, the blended learning approach. A course or curriculum is considered blended if 30% to 79% of the work is accomplished in a distance learning format. The Learning Air Force concept proposes that PME should be spread throughout the officer’s career. Before departing the commissioning source, an officer would begin PME distance learning. At certain times in their career, corresponding roughly with the current PME timeline, officers would have the opportunity to attend an abridged in-residence PME program. For example, if Squadron Officer School was accomplished in a blended format, Air Force captains would take courses every year via distance learning. These courses would be significant academic portions of the current Squadron Officer School curriculum. This approach would provide captains the opportunity to practice and hone the skills covered by the distance learning portion within a shortened in-residence program.

Though there were concerns about online, distance, and blended learning models when they initially became popular during the 1990s, research now suggests that the learning outcomes garnered from these sources and other correspondence methods of learning are comparable to traditional learning. As Larson and Sung of the University of Illinois at Springfield observed:
Based on the research performed over the last several years, it has become a foregone conclusion that there is no significant difference in student learning outcomes between face-to-face versus online delivery modes.

Therefore, the Air Force could accomplish its academic objectives via distance learning, using the in-residence portion of the Learning Air Force to allow airmen to practice the skills they learned. However, some skeptics argue certain topics are better taught in traditional classroom settings. These critics argue that those courses involving human interaction enhance learning (eg, leadership courses) may lose some of their effectiveness if taught in a distance or blended environment. For example, the Squadron Officer School in-residence program provides 8 weeks of cooperative learning, where students learn as a team, which is enhanced by the social structure of the flight (a group of approximately 14 students). Cooperative learning has been shown to be more effective than individualistic, competitive learning: students who are part of a team working towards a common goal typically achieve a higher level of learning than students working alone in competition with their colleagues.

Cooperative learning results in a greater transfer of knowledge than is generally achieved with individualistic or competitive learning. Squadron Officer School provides students with the opportunity to build a team among colleagues from different career fields across the Air Force. Squadron Officer School uses a format of guided discussion and analytical writing to allow students the opportunity to make their experiences relevant. Squadron Officer School is a nonretribution forum for the officer to converse with his/her colleagues in an engaging and analytical way. The current curriculum includes team-building and problem-solving activities, and team sports that keep students engaged in the learning process. Each team is challenged to set goals and overcome obstacles; the team is also encouraged to socialize together. The fact that the flights live together in the dorms, socialize together outside of work, and face both physical and mental challenges together solidifies the cooperative style of learning within the Squadron Officer School experience. Shortening the in-residence portion of Squadron Officer School in the Learning Air Force format could diminish this cooperative learning opportunity. It is not clear if such intangible benefits of in-residence attendance can be carried forward to a blended learning model.

While critics may argue that correspondence is the wrong forum for learning leadership, this view might be changing with technology. Roman argues that the US military remains rooted in an industrial-age paradigm, where control is emphasized over command. To illustrate Roman's point, the internet and other advanced methods of communication increasingly allow followers to be geographically separated from their leaders. Leadership by walking around may soon be replaced with leadership by virtual presence (eg, text messages, video teleconferencing, etc).

In summary, available technologies can supplement correspondence learning to ensure that most, perhaps even all, tangible benefits of in-residence learning are not lost. It follows that there are likely specific technologies that can facilitate the Learning Air Force concept to a degree that most, if not all, of the intangible benefits are retained. We investigate the intangible benefits in the first phase of our study because, unfortunately, such targeted discussion of intangibles as they relate to the Air Force is absent in the literature. Therefore, in the second phase of our study, we describe technologies that can be used to facilitate the Learning Air Force and other services' military leadership education programs via correspondence and blended learning methods. As stated, our first step was to uncover the intangibles of in-residence PME. We discuss our qualitative approach in the next section.

RESEARCH METHOD AND RESULTS

Because there are no established studies and, therefore, no established measurement instruments, we chose a qualitative content analytic, open-text response survey as our data collection instrument to provide respondents to identify relevant intangible benefits and drawbacks to attending PME in-residence without our biasing their responses.

Sample Frame and Data Collection

Our target population was captains in the Air Force. At the captain level, in-residence PME attendance approaches 100%. Additionally, many captains complete the correspondence version prior to attending in-residence. These captains are at the onset of their career and are likely to have the most to gain or lose over the course of their careers from any significant changes to the PME process. The research sample consisted of all individuals currently attending PME in-residence at Maxwell Air Force Base, Alabama, the primary in-residence location for all Air Force officer PME. We posit that this sample is representative of officers from the target population who would typically attend in-residence PME. We sent e-mail invitations for the on-line survey to all attendees of Squadron Officer School Class 13B. We also shared invitations by posting them to Squadron Officer School 13B's online learning platform. As part of the invitation process, we assured potential participants of anonymity.
and that we would not release raw results or identifying information.

In total, the sample contained 725 potential participants. After 2 weeks of data collection, 132 questionnaires were returned; of these, 124 were complete and useable for the study, resulting in a response rate of 17.1%. The demographic breakdown resulted in 100 males and 24 females, and the majority of participants (n=106; 85.5%) were between 26 and 35 years of age. Three (2.5%) participants were younger than 26 years and 15 (12.1%), older than 36 years. On average, participants have 1.3 dependents (SD=1.2) and deploy 94.4 days per year (SD=75.8).

To collect the necessary data for analysis, we developed an open-text response survey consisting of 6 demographic questions and 2 open-ended questions. We compiled these questions and demographic items onto a web-based questionnaire for ease of distribution, ease of data collection, and for increased accuracy (that is, a single point of data entry: when the respondents entered the information). The open-ended questions were:

1. From a career development perspective, what are the advantages of an in-residence vs a correspondence PME course? What are the intangible benefits of in-residence PME attendance?
2. From a career development perspective, what are the disadvantages of an in-residence vs a correspondence PME course? What sacrifices might one make to attend in-residence PME?

Content Analysis and Results

Content analysis is one method used to derive various themes from a body of text to assess several forms of documentable communications.12 It is “a research technique for reducing large quantities of text into a more manageable form for inference and analysis.”13 In this research effort, we adopted procedures for problem-driven content analysis, using steps outlined by Krippendorff.14 For our qualitative analysis of the survey data, we used MAXQDA (VERBI GmbH, Berlin, Germany), a qualitative data analysis package, to organize, recall, and analyze the data. To begin, we uploaded all data to create a unique MAXQDA project and started the project by separating data into 2 categories, corresponding to the 2 open-ended questions posed to participants. The first category represented potential benefits, whereas the second category represented potential drawbacks.

The next step of content analysis calls for identifying themes in the data and counting the number of occurrences of each theme. Unfortunately, the literature did not yield a theoretical or practical framework with which to guide our search. Therefore, we chose a Grounded Theory approach to extracting relevant themes from the data. Grounded Theory takes into account pragmatic ideas proffered by participants to generate a theoretical framework from the collected data.15-17 In other words, the theory is grounded in the data, as opposed to a theory chosen a priori. The Grounded Theory approach calls for identifying emerging themes from the qualitative data and categorizing responses according to these themes.

To begin, we identified units of analysis and categorized them into overarching themes. Our definition of the unit of analysis was any expression mentioned by a participant that noted an intangible consequence of in-residence PME. Each expression was represented in the data by an independent text segment—words, a sentence, or a paragraph—that describes the consequence. The new themes were self-defined from the respondents’ input garnered during data collection, thus grounding the results from the data as opposed to researcher predetermined theoretical framework. The data suggest 6 primary themes regarding benefits and 4 primary themes regarding drawbacks of in-residence PME identified in the Table. In addition, secondary themes were identified under some of the primary themes. Although research team members analyzed the data together to reach 100% agreement, further examination was needed to confirm the reliability of the results. Using a random number generator, the research team generated a sample of 20% of the responses for an outside participant to independently analyze. The outside researcher was asked to independently match each text segment in the 20% sample to the appropriate themes from the Table. We calculated Krippendorff’s alpha coefficient (α)—a statistic used to assess reliability of content analysis research—to be α=.88. As a heuristic comparison, coefficients above α=.80 suggest adequate reliability.14
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Themes Identified in the Data.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Benefits</td>
<td>Meeting and socializing with others</td>
</tr>
<tr>
<td>1 Networking (95.2%)</td>
<td></td>
</tr>
<tr>
<td>a. Learning about other jobs/bases/experiences (45.1%)</td>
<td>Gaining first hand understanding of what peers do across the Air Force</td>
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<tr>
<td>b. Professional networking (27.4%)</td>
<td>Meeting and socializing with others for the purpose of enhancing one's career</td>
</tr>
<tr>
<td>c. Personal networking (22.6%)</td>
<td>Meeting and socializing with others for the purpose of friendship</td>
</tr>
<tr>
<td>2 Time for learning (57.2%)</td>
<td>Having ample time for learning</td>
</tr>
<tr>
<td>a. Time away from other Air Force duties (40.3%)</td>
<td>Time for learning that does not interfere or compete with other Air Force obligations</td>
</tr>
<tr>
<td>b. &quot;Reblue&quot;/reflect upon Air Force (8.9%)</td>
<td>Time available to reflect upon one's career in the Air Force</td>
</tr>
<tr>
<td>c. Time for introspection (8.0%)</td>
<td>Time available to reflect upon oneself</td>
</tr>
<tr>
<td>3 Practical application of materials (42.7%)</td>
<td>The opportunity to practice the skills learned in the classroom in a real-world, hands-on environment without consequences of failure</td>
</tr>
<tr>
<td>a. Leadership (16.1%)</td>
<td>The opportunity to apply leadership training in a hands-on leadership laboratory</td>
</tr>
<tr>
<td>b. Group dynamics and teambuilding (12.9%)</td>
<td>The opportunity to be a member of a small team and work through/apply team building and group dynamic concepts</td>
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<tr>
<td>c. Social skills (8.9%)</td>
<td>The opportunity to hone interpersonal and social skills amongst others (ie, feedback)</td>
</tr>
<tr>
<td>d. Communication (4.8%)</td>
<td>The opportunity to speak in front of a live audience and obtain formal and informal feedback</td>
</tr>
<tr>
<td>4 Rich discussion (28.2%)</td>
<td>The enhanced quality of communications at in-residence PME</td>
</tr>
<tr>
<td>a. Face to face discussion of topics (24.2%)</td>
<td>Communication quality directly attributed to the face-to-face communication medium</td>
</tr>
<tr>
<td>b. Guarantee of nonattribution (4.0%)</td>
<td>The belief that thoughts and opinions will not be recorded or leave the classroom environment</td>
</tr>
<tr>
<td>5 Prestige associated with in-residence learning (6.5%)</td>
<td>Feeling that the Air Force uses in-residence PME as a discriminator for advancement and other opportunities</td>
</tr>
<tr>
<td>6 Facilities available to enhance education (2.4%)</td>
<td>The availability of tangible facilities, such as libraries, exercise facilities, and outdoor team building facilities (project x)</td>
</tr>
<tr>
<td>Drawbacks</td>
<td>Time spent away from home station and one's primary job responsibilities</td>
</tr>
<tr>
<td>1 Time away from primary duties (77.4%)</td>
<td>The feeling that one is letting their home station team members down by being gone for an extended period</td>
</tr>
<tr>
<td>a. Increased workload for others in unit (41.1%)</td>
<td>The feeling that one will return to a mounting workload and/or will have to catch up with work center happenings and job proficiencies</td>
</tr>
<tr>
<td>b. Falling behind in regard to work-related duties (20.1%)</td>
<td>The potential for a crew member to go noncurrent</td>
</tr>
<tr>
<td>c. Flying currency (16.1%)</td>
<td>Time spent away from one's loved ones and personal life at home station</td>
</tr>
<tr>
<td>2 Time away from family/home (51.6%)</td>
<td>Time spent away from one's loved ones and personal life at home station</td>
</tr>
<tr>
<td>3 Lost career/work opportunities (18.5%)</td>
<td>The perception that one might miss out on opportunities presented while they are absent and/or the opportunity cost of attending PME vice another career enhancement opportunity</td>
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minimized via innovative technologies. Recent research has suggested that image digitizing systems (eg, video, photography) and mobile computer devices such as smart phones and touch-screen tablets will be in greater use for education over the coming years.18 We focus on 2 exceptional alternatives that can be employed to improve PME. Subsequently, we address how such technologies can be procured and sustained.

Mobile Technologies

The 2011 Horizon Report highlights 2 technologies that are already beginning to change the way complex subjects are taught in higher education: mobile technology and game-based learning.19 According to Pew Internet and Mobile Life Project research, 66% of people between the ages of 18 and 29 own a smartphone, and the number continues to rise.20 In the US, 55% of universities have activated mobile applications for students to use with functions that include providing school wide emergency alerts, making coursework accessible on-demand, and enabling collaboration for students on-the-go.21 Apple demonstrates these capabilities in an application called iTunes University,22 which allows faculty to create courses and disseminate material using PDF documents, e-books, videos, and other media to provide cheap online courseware to students around the world.
Many highly regarded institutions (including Stanford and MIT) are currently using iTunes University to provide content to their students on both Windows and Macintosh operating systems. The use of mobile applications in PME would allow the Air Force to provide coursework to students on devices the students already own and use, which will likely help enhance the richness of discussion and courseware that was cited by 28.2% of the study’s participants as being important (Benefits item 4 in the Table).

While mobile technologies present a tenable solution, one must also factor software and hardware costs into the decision-making process. For example, a mobile application can cost as much as $250,000 to develop.23 Another consideration is the cost to secure such a network.24 We believe a full cost-effectiveness business case is an essential element before determining how to implement Learning Air Force should leadership pursue that course of action.

Gaming Technologies

Mobile communications devices may be suitable to provide videos, readings, and other coursework to students, but advancements in gaming technology offer the Air Force an opportunity to create a virtual learning environment that can potentially meet many of the current PME objectives while retaining some of the intangibles previously mentioned. The current outdoor, hands-on leadership lessons create an environment designed to prompt students to apply effective problem-solving, teambuilding, leadership, and communication techniques. Our results suggest that such practical application of course material is an important benefit of in-residence PME attendance.

The US Army has already adapted virtual environments to training, working with the commercial gaming industry to produce complex environment simulators. In August of 2012, the Army unveiled the Dismounted Soldier Training System (Figure 1), designed to place soldiers in a virtual environment to explore terrain, interact with civilians and enemy combatants, coordinate tactics, and train similarly to how they fight in the real world.25 The Army Program Executive Office for Simulation, Training, and Instrumentation partnered with programmers from commercial software developers to use the CryEngine 3 graphics engine to create a realistic virtual environment, which may be useable to supplant or supplement the learning facilities cited by the study’s participants as important (Benefits item 6 in the Table). CryEngine 3 is the latest version of the graphics engine used to develop the popular Crysis video game series. Indeed, this framework could be used in the development of Air Force PME software focusing on retaining intangible benefits of in-residence PME, such as networking, rich discussion, and practical application of course material, while executing learning from a distance.

Many new games require players to use the same principles in order to be successful. As Gee26 argues:

Digital games are, at their heart, problem solving spaces that use continual learning and provide pathways to mastery through entertainment and pleasure. Not surprisingly, there has been a growing interest recently in so-called serious games that involve learning the sorts of domains, skills, or content that we associate with school, work, health, citizenship, knowledge, construction, or community building, and not limited to pure popular form of entertainment…

In the past, computer games were designed for entertainment purposes. However, new games have become complex enough to fuse education and entertainment. Game developer Valve demonstrated this new fusion when it released Portal 2 in 2011. The game, which features a cooperative mode, puts multiple geographically separated players in a 3D environment and requires them to think critically to solve puzzles of increasing complexity. The Associated Press named Portal 2 the game of the year in 2011 and more than 3 million copies of the game have sold.27 Valve has even released an educational tool based on the game called *Teach with Portals*, a classroom version of the game that allows teachers to build lesson plans around concepts found within the game.28

Software Collaboration Tools

Many sophisticated collaboration tools are now available for small scale electronic platforms. The Air Force could easily use existing packages augmented with commonly used communications methods to achieve a robust...
collaboration environment through the use of personal electronic devices. The easiest and most cost-effective solution would likely be to use the Air Force’s Blackboard and DoD’s Defense Connect Online software solutions. Blackboard could be used to deliver academic content similar to how it is used with the in-residence portion of PME. Students could access Blackboard on their personal computers or personal electronic devices. Defense Connect Online could then be used to deliver real-time or recorded seminars to students and afford them a place to meet in a virtual environment, which would help to carry forward the intangible benefits of rich discussion and communication feedback. The Connect mobile application provides the capability of video conferencing from a phone. For familiarity purposes, students could choose to use other video technologies, such as Skype, provided they record and save conferences for instructor review. Indeed, there is a variety of commercial off-the-shelf video teleconferencing platforms that could be used by the Air Force and other services.

Software Support Considerations

To properly implement these and other education-based technology, it is essential the infrastructure is both available and capable of supporting the systems. We provide several approaches to address this concern.

Legacy and Aging Technology Support

Support for aging infrastructure and hardware is a key consideration when deciding on the appropriate platform for a given software solution. Software requirements do not often change after an initial release. What must be examined is the level of sophistication for which the Air Force or other services can effectively plan during its initial course software deployment. This limitation will determine number of concurrent users, the visual complexity, and overall processing capabilities for the generation of technology being studied. Air Force communication squadrons typically anticipate and budget to replace user workstations every 2 to 3 years, which approximately agrees with Moore’s law* for expected hardware growth. In 2010, the average American upgraded their mobile device every 21.7 months.30 By tailoring a software solution to accommodate personal electronic devices and to more specifically target a smaller subset of Android and Apple iOS devices, the Air Force can effectively obviate a communications squadron update for educational devices cycle.

In the event that the Air Force must maintain a small collection of tablets or small media devices at education offices, it must be noted that these devices are cheaper than workstations and typically have a longer usable lifetime. The update time frame, which is consistent between the government and the commercial market, would be the approximate amount of time Air Force education software should reasonably be required to support older hardware. This is typically 5 to 7 years. Air Force control over education software will drive device replacement and update. If major versions and updates to the curriculum can be planned for approximately every 3 years, then such updates will be able to take advantage of hardware modernization. Software, on the other hand, will not require as frequent updating. For comparison, the simulation software used for war gaming at Squadron Officer School could be used as an example. This software is relevant both educationally and visually, and is almost a decade old. Another example can be found in America’s Army 3, a free game released by the US Army in 2009 (Figure 2). It is a technologically advanced game that is still relatively popular on the internet. These 2 examples demonstrate that strong applications can be created for platforms well within the anticipated hardware cycle limits. By catering to personal electronic devices, the requirement to support legacy or very old equipment is reduced to supporting equipment only a few years old.

Rapid Procurement and Curriculum Updates

Speed and agility are keys in the cyber domain. These keys translate to any technological capability, including education. However, there are many barriers to the adoption and use of educational innovations.31 A computer-based course affords the Air Force rapid updating if control is appropriately managed at the correct level. The idea of rapid updates or acquisitions is familiar to the Air Force community at large as Big Safari. The Big

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*Gordon E. Moore, cofounder of Intel Corporation, stated that the number of transistors placed on integrated circuit chips doubles every 24 months. His observation has proven fairly accurate, in part, as a self-fulfilling prophecy: circuit manufacturers use Moore’s law in their strategic planning.29
Safari concept “is used to accomplish special projects on a quick-reaction basis” to deliver time-sensitive capabilities in an expedited fashion. The positive lessons learned from the Big Safari program could be applied to the PME environment as a means to keep up with the evolving curriculum and the continuous updating of technology to support it. The presentation of updated and approved course material should not be stifled by a cumbersome technological solution. An agile technological solution would provide an environment to allow for a rapid update of the accredited material.

CONCLUSION

As the Air Force continues to evolve in order to sustain its position as the most powerful air, space, and cyber force in the world, the way it conducts its PME must also evolve. As General Welsh states in his Vision for the United States Air Force:

> 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.

The Learning Air Force approach might offer a viable roadmap for such change. Regardless of the specific way forward, the intangible benefits of today’s PME must be retained and the existing drawbacks diminished. Focusing on the Air Force’s program, we provided a qualitative content analytic examination of the intangible benefits and drawbacks of in-residence PME; we provided prospective methods to retain the benefits and minimize the disadvantages; and we synthesized our research with the literature to propose the adoption of innovative technologies that can enhance the PME experience. Following our suggestions can reduce costs, improve the quality of education, expand the scope of the education experience, and potentially increase student enjoyment. Further research in this area should extend the analysis to the other services and synthesize the findings with the current study to strengthen the results. Other research opportunities exist as well. An experiment or quasi-experiment, designed to empirically evaluate the effect of the intangibles on PME outcomes is an obvious next step. Indeed, while the unit of analysis in our study is the Air Force company grade officer, the net benefits of a robust PME system are not individual-level outcomes; they are organizational-level outcomes and can be applied across all services. It is, in part, through a well-educated officer corps that the US military services will continue to meet their commitments and execute their roles in the National Security Strategy.

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REFERENCES


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