



Systems Engineering Graduate Education for Veterans - A Pilot Program

Dr. Michael C Smith, University of Virginia

Mike Smith earned his B.S. and M.S. at the University of Tennessee-Knoxville and Ph.D. from the University of Missouri - Columbia. He has worked across a variety of application domains including manufacturing, transportation, defense, and health care. His 20+ years in the private sector and ten years in academia give him the combined perspective of academic rigor and pragmatic problem solving that helps bring solid solutions to challenging problems. Mike and his wife, Amanda, have four children and two grandchildren and enjoy biking, hiking, camping, reading, and hanging out with the grandkids.

Dr. Barry Horowitz, University of Virginia

Munster Professor and Chair of the Systems Engineering Department at the University of Virginia. Prior to joining UVa served as CEO of the Mitre Corporation. Member of the National Academy of Engineering and currently serving on the Naval Studies Board, the General Electric Academic Software Advisory Board and the Research Council of the Systems Engineering Research Center sponsored by the DoD and managed by the Stevens Institute.

Dr. Thomas S. Brett, Dept of Systems Engineering, School of Engineering and Applied Science

Graduate of SUNY- Buffalo (JD), SUNY- Albany (MS Business Administration) and Graduate of St Bonaventure University (BS Economics) Member of the New York State Bar, and the United States Supreme Court Bar. Practicing attorney for more than thirty five years with the United States Department of Justice, Washington D.C, United Technologies Corporation and the Brett Law Firm, LLC, Syracuse, New York. Combat veteran of the United States Army Artillery, highest rank, Captain recipient of the Purple Heart. Currently Veterans Coordinator for Accelerated Masters Degree Program in Systems Engineering at the University of Virginia (August, 2010- present)

Systems Engineering Graduate Education for Veterans at the University of Virginia - A Pilot Program

Motivation

In August 2009, the U.S. Department of Veterans Affairs (VA) began administering a new program of educational benefits for veterans of the U.S. armed forces. The program greatly expands the post-secondary educational benefits available to veterans who served on active duty after September 10, 2001. At the same time, concerns about the adequacy of the future U.S. engineering and science workforce focused greater attention on the nation's science, technology, engineering, and mathematics (STEM) capabilities. The post-9/11 veterans' educational benefit created an opportunity for the United States to expand its technical workforce while serving those who served. Post-9/11 veterans include a diverse and qualified pool of future talent for the nation's engineering and science employers. Ushering them into technical fields as work-force ready engineers and scientists requires a community of partnerships between the veterans, the nation's educational institutions, technology firms, the government's technical and scientific organizations, and others.

To help form those partnerships and generate ideas on how to encourage post-9/11 veterans to use the new benefit toward educational opportunities that lead to careers in science and technology, the National Science Foundation (NSF) sponsored a workshop in April, 2009 in which participants identified needs and opportunities and laid out principles and strategies for assisting eligible veterans to obtain the education needed to transition into advanced technology careers in government and industry. The workshop findings are available in the report "Veterans' Education for Engineering and Science" posted on NSF's web site at www.nsf.gov/eng/eec/VeteranEducation.pdf.¹

The University of Virginia offers a customized pilot Accelerated Masters Program in Systems Engineering for Veterans (AMP-V); a program based upon an existing program, but modified along the lines of the principles established at the NSF workshop for tailoring educational programs toward the career development interests and special needs of veterans. This tailoring was done with the specific intention of ***developing approaches for implementation that can be used as a basis for expanding the pilot program at [to be added], and for other institutions to use as a starting point for similar programs.***

Accordingly, the pilot program includes experimenting with new approaches for:

- Providing a path for veterans with any bachelors degree to gain a masters degree in systems engineering within a relatively short time period, and have immediate opportunity for meaningful and rewarding engineering jobs
- Providing a schedule for completing the requirements for a masters degree in as little as one year, with attendance confined to all day Friday and Saturday every other week (permitting employment while completing the program)
- Developing a group of AMP-V program stakeholders consisting of industrial and government organizations who will be interested in hiring the students upon graduation

- Developing a curriculum that stakeholders find of greatest potential value and can be sensibly integrated into the curriculum
- Developing methods for attracting veterans into the program
- Providing preparatory courses as a preamble to the AMP-V program that serve to either ready those who have never taken the required prerequisite courses or to refresh those who have already taken those courses, but do not feel academic-ready

Veterans are already realizing benefits from their advanced degree in systems engineering, as evidenced by both employment opportunities and career opportunities. As the AMP-V program continues to produce new graduates, future data collection efforts will calibrate program value as determined from the perspectives of students, employers, and the University.

This paper elaborates on the three-year effort for an AMP-V program, including the program planning, re-planning, evaluation and documentation efforts over two full cycles of program delivery.

Program Concept

The University of Virginia offers a Master's of Engineering in System Engineering degree program designed specifically for veterans eligible for benefits under the 9/11 GI Bill who want to pursue career opportunities in advanced technology fields but lack the academic and professional experience to enter these fields. The program is designed so that veterans can continue full-time employment while they pursue the degree and still receive maximum benefits for which they are eligible under the GI Bill. In addition, active duty military stationed nearby can enroll in the program so that they are prepared for more advanced assignments in their services or to transition into civilian positions when they complete their active duty assignments. Finally, because the degree can be completed in one year, veterans retain a substantial portion of their benefit eligibility for future education or for use by eligible dependents.

The program was designed with the following guidelines in mind:

- Qualified veterans with undergraduate degrees in non-technical areas can enter the degree program after successfully completing articulation courses that are integrated into the curriculum and program schedule. Applicants need not have an undergraduate degree in engineering or science to apply to the program.
- The academic program is integrated with a professional practice and research experience to ensure that degree recipients have ample opportunity to apply what they learn in realistic settings. The focus of the program is on practice and career development.
- The program provides substantial assistance in identifying appropriate career opportunities in government agencies and the private sector by establishing partnerships with potential employers who sponsor internships and individual

research/project opportunities. Program success is measured by successful transition into advance technology careers.

- The program is delivered on weekends (Friday and Saturday) so that veterans can continue full-time employment while earning an advance degree. Students can continue working for employers who can offer them new career opportunities after graduation.

Program Objective

The objective of the Accelerated Masters Degree Program in Systems Engineering for Veterans, or AMP-V, is to assist veterans retuning principally from military service in Iraq and Afghanistan to transition to advanced technology careers in private industry and government agencies thereby enhancing the United States science and technology base while providing these veterans promising professional opportunities.

Academic Program Overview

The Accelerated Master's Program for Veterans, or AMP-V, is integrated into the existing Accelerated Master's Program (AMP) in Systems Engineering, which the System and Information Engineering Department has offered since 1999. The cohort model is centerpiece of the approach, enabling students to learn from each other as well as from highly qualified instructors as they progress through a rigorous academic curriculum, culminating in a group capstone project that offers substantial exposure to and interaction with government and industry organizations.

The 33-hour Master's in Engineering in Systems Engineering degree program is delivered over three terms: Summer, Fall, Spring. Summer term consists of one week in residence plus one 10-week session; Fall semester consists of two 10-week sessions and Spring semester consists of one 10-week session plus a second week-in-residence for a total of two weeks-in-residence and four 10-week sessions. One course is taught during each of the weeks-in-residence and two courses are taught during each of the four 10-week sessions for a total of ten 3-credit hour courses. An additional three credit hours are earned through a seminar series conducted throughout the program.

Program Delivery Approach

The program consists of a series of interacting program elements that serve to recruit, prepare, matriculate, educate, graduate, and help gain employment for post 9/11 veterans in engineering organizations. Tuition and fees for the program for veterans is compatible with the educational benefits offered by the post 9/11 GI Bill benefits and consistent with the tuition and fees approved by the Board of Visitors for all students enrolled in the Accelerated Master's Program.

Ten program (see Figure 1) elements form the basis for the pilot Accelerated Master's Program tailored for eligible veterans. Together they comprise the roadmap used to

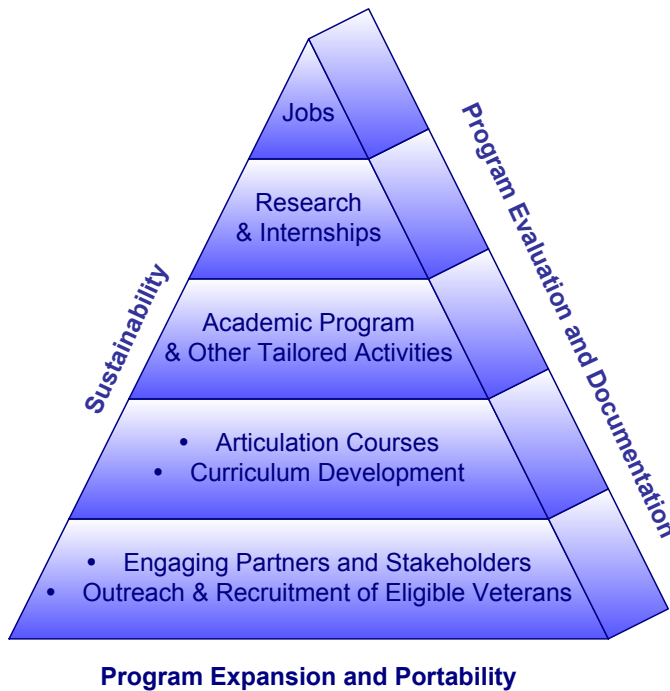


Figure 1 Program Elements for the AMP-V.

the Middle East after the program started); and the 2012-13 cohort includes 12 veterans. Each of these cohorts had a total of 30-40 students so veterans represented a significant portion of the 2011-12 and 2012-13 cohorts. In most cases, these veterans were already employed and see the program as a way to advance their careers or to transition careers in other domains. There were cases where active duty military are transitioning from military service to civilian career, as was the case with a Navy Lieutenant Commander who was a Navy recruiter and AMP-V student who transitioned into the civilian work force upon successful completion of AMP.

The 2012-13 cohort includes an active duty USAF officer, a retired Navy officer, a current member of the Virginia National Guard, and several graduates of the U.S. Military Academy who served in Iraq or Afghanistan before leaving military service. Several of these veterans completed one or more articulation courses prior to enrolling in the Accelerated Master's Program. Service academy graduates typically have taken most of the prerequisites since the service academies generally require some level of technical and analytical coursework regardless of the degree awarded. Consequently, even though service academy graduates may not have an engineering or related technical degree, they typically have adequate background to enroll and succeed in the program.

develop and deliver this pilot program and can inform delivery of other degree programs and at other institutions.

The program elements are interrelated and were executed iteratively throughout implementation and delivery of the AMP-V. Key activities and outcomes in these areas are presented in Table 1.

The results of these and other efforts were productive in recruiting veterans into the Accelerated Master's Program. The 2010-11 cohort, the initial year of the AMP-V, included three veterans; the 2011-12 cohort included 13 veterans (one withdrew after being deployed to

Table 1. AMP-V Program Elements, Key Activities, and Outcomes

Program Element	Activities	Outcome
<p>1) Engaging Stakeholders; Outreach to Veterans</p>	<ul style="list-style-type: none"> Industry Partners Workshop held October 2, 2009 to review program structure, curriculum, delivery format, schedule, and transition to civilian workforce. Extensive outreach and marketing effort to raise awareness of the program within veterans' organizations, employers, military installations, and education and career events oriented toward veterans and active duty military. 	<ul style="list-style-type: none"> Consensus on need, opportunity, program structure, and curriculum, built around classical systems analysis and design framework stressing systems modeling and related analytics. Network of contacts and relationships (including MOUs) with organizations where veterans learn about education opportunities. Growing body of veteran alumni who promote the program among peers. Increased veteran enrollments from three in 2010-11 to twelve in 2011-12 and twelve in 2012-13.
<p>2) Articulation Courses & Curriculum Development</p>	<ul style="list-style-type: none"> Identification of appropriate articulation courses for veterans and other students to complete in preparation for the AMP, including offering an online probability course through the University of Virginia in a time frame that enables them to complete the course in time to enroll in the program. As veterans lacking prerequisite courses were identified, detailed articulation plans were developed to ensure that they had the background needed to enroll in and complete the program successfully. Curriculum based on existing systems engineering graduate programs with emphasis on professional practice across multiple domains. 	<ul style="list-style-type: none"> Delivery of online articulation courses through UVA School of Continuing and Professional Studies Identification and vetting of growing availability of online courses offered by other institutions, including massive online open courses (MOOCs) as refresher courses. Validation of quality of articulation courses for preparing veterans for graduate level coursework. Curriculum built around "systems thinking" - systems methodology, modeling and analysis, data analysis, risk assessment, plus key business concepts.

3) Tailored Academic Program	<ul style="list-style-type: none"> • Coordination with the Registrar's office to ensure that the program is structured to be consistent with VA requirements for certification for full-time student status so that veterans receive all benefits to which they are entitled. • AMP-V program staff engaged with other faculty and staff from other Schools and offices within the University to identify opportunities for assisting veterans throughout their entire engagement with the University. 	<ul style="list-style-type: none"> • All veterans who choose to use their GI Bill education benefits are certified as full-time students and entitled to full benefits for tuition, housing allowance and book stipend. • Program staff are part of a University-wide coalition to enhance opportunities for veterans and provide a veteran-friendly academic environment.
4) Research & Internships	<ul style="list-style-type: none"> • Continuous interactions with government and industry partners to develop capstone projects, seminars, and other activities of particular interest to veterans, including projects with the United States Department of Transportation, the Naval Sea Systems Command, the Federal Emergency Management Agency, and the UVA Health System. 	<ul style="list-style-type: none"> • Industry and agency partners provide project opportunities through capstone projects designed to provide both an opportunity to practice the skills learned in the academic program and to gain exposure to professional opportunities in domains of interest to both transitioning and currently employed veterans.
5) Jobs	<ul style="list-style-type: none"> • Assistance from the School of Engineering and Applied Science Career Services Office in preparing for transition to civilian employment, including presentations at AMP seminars explaining Career Services programs, access to employers and employment opportunities, individual assistance in preparing resumes, practice for telephone and in-person interviews, and access to Career Fairs exclusively for UVA students and alumni. • Personal career assistance through recommendations, personal contacts, and referrals to industry partners for veterans seeking employment or seeking job changes as they complete their degree program. 	<ul style="list-style-type: none"> • Most veterans who enroll are already employed in technical positions and have used the degree to advance in their organizations. • In each class, some veterans are either transitioning from military to civilian live or seeking to transition into more technical responsibilities; these veterans have been placed either through our existing network of industry and agency partners or through interaction with the AMP alumni network. • AMP alumni frequently contact program staff, seeking AMP graduates because they find value in their academic background and demonstrated competency.
6) Program Evaluation & Documentation	<ul style="list-style-type: none"> • A mid-program review by an NSF evaluation team from Pennsylvania State University that is documented in a report to NSF, along with findings for other NSF-funded pilot programs for veterans. 	<ul style="list-style-type: none"> • The NSF evaluation identified recruiting veterans who have the academic background or who are willing to obtain the necessary background as a major challenge for graduate level engineering programs oriented toward veterans.

<p>7) Sustainability</p>	<ul style="list-style-type: none"> • Careful monitoring and evaluation of veterans' academic progress to ensure they received the support needed to complete the program successfully. • Monitoring and review of the program's financial model to ensure that it delivers an exceptional academic experience that can be completed within the benefits available through the GI Bill. 	<ul style="list-style-type: none"> • Over the past three years, the VA has modified what is covered and the level of funds provided under the GI Bill, resulting in some uncertainty on the part of both veterans and the AMP program. • At present, the funding available to veterans who are eligible for full benefits under the Post 9/11 GI Bill is adequate to cover the entire cost of the program and the program is sustainable with this funding level.
<p>8) Portability & Expansion</p>	<ul style="list-style-type: none"> • Considering way to delivery program content in ways that retain the value of peer-to-peer interaction while reducing the burden on students (e.g., through virtual classrooms) • Discussing opportunities with military installations for integrating military academic programs with the Accelerated Masters Program. 	<ul style="list-style-type: none"> • The delivery format is transferable to other locations that are within reasonable proximity of significant veteran populations; however, as virtual presence becomes more pervasive and the collaboration tools improve, alternatives to classroom-based delivery may be practical for programs such as this that rely heavily on case-based instruction, classroom discussion, small group activities, and peer-to-peer interaction.

Evaluation

The pilot program was one ten NSF-funded programs that targeted veterans' education in science and engineering, and, as noted previously, the NSF engaged an independent evaluator to review all of the programs to assist NSF and its grantees in determining the success of program outcomes.² The evaluation included institutions that are considered "veteran friendly" because they offer a variety of services and accommodation for veterans, including offering academic credit for equivalent courses completed while serving in the military, and, in some cases, waiving application fees and other fees associated with enrolling in courses. The evaluation also included grantees that do not meet the formal definition of "veteran friendly" but do offer programs geared specifically to veterans or make efforts to integrate veterans into existing programs more effectively. AMP-V is not in an institution that meets all of the criteria to be designated as "veteran friendly" but it does offer many programs and accommodations geared toward veterans, including priority enrollment for veterans in high demand courses.

Of the ten NSF-funded programs for veterans, all except the AMP-V were directed primarily toward undergraduate education, and included a wide range of institutions in terms of geographic location, selectivity, size, and governance (i.e., public versus private). The AMP-V is offered through the University of Virginia, a large public institution regarded as selective in admissions with an emphasis on high quality undergraduate and graduate education.

The independent evaluators observed AMP-V classroom activities, interviewed veterans enrolled in the 2010-11 program and AMP-V program leadership, and met with the university veterans' coordinator. The analysis included the following observations:

The goal for its NSF grant is to adapt its Accelerated Master's Program in Systems Engineering (AMP) to meet the needs of military veterans, which it is calling AMP-V. This program would build on the existing AMP program. In the 2010-11 the program enrolled a cohort of 32 students, two of whom were veterans using post-9/11 benefits to fund a portion of their tuition. The program established a goal of enrolling 10 – 12 veterans in the 2011-12 cohort. The AMP program requires students to have a fair amount of technical college coursework prior to enrollment, including two semesters of calculus, a calculus-based probability course, linear algebra, and courses or experience in computer programming. The AMP staff assists potential students in identifying appropriate courses to complete for additional preparation or remediation in any of these courses, however, if they are lacking in one or more of them.

The analysis continues with the following observations

As the AMP Executive Director described their recruiting efforts, "We're selling retail." The AMP staff know that the Systems Engineering Master's Program is fairly specialized, and thus, most of their recruiting success has been in reaching people one-on-one, rather than trying to reach large numbers of individuals through things like "blast" emails or widespread marketing. They often relied on word-of-mouth contacts, such as through the education coordinators on military

bases as well as through other contacts they had made. They felt that the Open Houses they offered roughly once a semester on campus, as well as off-campus information sessions, were effective in recruiting individuals who had shown initial interest in the program.

The AMP-V program enrolled 13 veterans – 11 who have been separated from active duty – and two active duty military personnel in its 2011-12 cohort, which started its studies in May 2011. Thus, the program reached its goal. However, staff were very clear that success for the program could not be measured by enrollments alone. The Executive Director observed:

There are two aspects to it. One is obviously getting a number of veterans into a pipeline but awarding the degree is not success. Success is veterans who come through the program who were not previously employed in the kind of positions they were seeking who find successful employment and a year after they graduate are active and doing well in a career and report satisfaction of having gone through the program and found a job that they like. I think anything less than seeing them transition into employment opportunities is not success.

Outreach to Veterans

One of the mid-point evaluation's primary observations regarded the effort needed to make veterans aware of the program and its potential for providing the skills and education needed to pursue opportunities in technical career fields. This has been major program focus since the program's inception in 2010.

Awareness was enhanced through military publications, participation in service related education and career fairs, posting on military installation Face Book pages, email notices to military academy and other alumni chapters which in turn are published on social media sites such as 'AKO' (Army Knowledge Online). Focus attention was given to prospective students at selected military installations and ROTC programs within the University of Virginia and other institutions in the Commonwealth of Virginia. Finally, outreach efforts were augmented through targeted information sessions and personal contacts and through direct follow up with prospective students to address transition issues and assist in the application process.

In addition to typical outreach activities directed toward the general advanced degree seeking population, specific AMP-V efforts directed toward the veteran and active duty military population that might not be reached through employers, regional information sessions, and AMP Open House events include:

- Advertisements in newspapers and on web sites oriented toward veterans and active duty military
- Outreach to military installations through personal contacts and visits

- Visit to Walter Reed Army Medical Center to raise awareness of education and professional opportunities following rehabilitation and military service
- Information Session at Ft. Eustis Education Center
- Drop In Q & A at Ft. Lee Education Center
- Visit to Educational Director at Ft. Benning, GA
- Personal meeting and AMP-V presentations to the Commander, Naval Sea Systems Command and two of his direct reports
- Presentation at the Virginia Veterans Memorial in Richmond, VA
- Visit to Ft. Bragg to reach returning veterans who relocate within proximity to AMP-V
- Discussions with ROTC leadership at UVa, VMI, and The College of William & Mary, and the University of Richmond to promote the program among ROTC students
- AMP-V presentation for NAVSEA at Washington Navy Yard
- MOU between the School of Engineering and Applied Science and VMI regarding consideration of VMI alumni for admission to the AMP-V upon graduation from VMI or completion of military service.
- Multiple mass communication efforts
 - Lee Key email blast (Ft. Lee)
 - Post email announcement to Ft. Eustis and Langley AFB
 - Email blast to Ft. Belvoir personnel
 - Email message to UVa Navy ROTC alumni
 - Virginia Department of Veterans Services e-News article
 - Flyer and email message to Virginia Department of Veterans Services listserv
 - Email to Service Academy Career Conference registrants
 - Messages posted to the Ft. Drum Facebook page regarding AMP-V
 - Email message to USMA alumni association of Virginia
- Participation in Career and Education Fairs and Symposia
 - Washington Post Engineering, Technology, and Security Clearance Career Fair
 - Table Top Exhibits at Norfolk Naval Station, hosted by ASNE
 - American Society of Naval Engineers Fleet Maintenance & Modernization Symposium, booth and web site presence
 - Education Fair at Ft. Belvoir
 - ASNE Day
 - AFCEA Luncheon Announcement/Networking Session
 - Defense Enterprise Round Table Lunch & Learn
 - DIA Lunch & Learn
 - Service Academy Career Conference, Washington, DC
 - Henderson Hall Education and Career Fair

Challenges

The major challenges in delivering an effective and sustainable Accelerated Master's Program in Systems Engineering for Veterans are 1) identifying the pool of prospective

students among the returning veteran population and 2) ensuring that returning veterans have the academic background needed to complete the program successfully.

The pilot program addressed these challenges through extensive outreach and awareness efforts spearheaded by a dedicated Veterans' Coordinator who is a veteran and has a solid network of contacts within the military community where the AMP-V can be presented and promoted. In addition to identifying appropriate articulation courses that prospective students can take from other institutions, an online calculus-based probability course designed and scheduled specifically for students entering the Accelerated Master's Program helps enrolling students prepare for the rigorous coursework required in the program.

Most veterans who enroll in the program are either employed when they enroll in the program or, upon completion of the program, have little difficulty transitioning into the civilian workforce. The University of Virginia School of Engineering and Applied Science Career Services office provides substantial assistance in placing graduates in excellent positions and the AMP program staff members have ample contacts with our industry partners and are able to align the needs of our partners with the availability and interests of our graduates. Graduates are in high demand as evidenced by the frequent request for referrals that come from industry partners and AMP alumni who know the quality of talent available in the pool of AMP graduates.

When AMP-V was conceived, the details of benefits available under the Bill were still being determined. The Bill called for paying the maximum in-state tuition and mandatory fees paid directly to the institution plus a book stipend and a monthly housing allowance paid directly to the veteran. The first class of veterans who enrolled under the Post 9/11 GI Bill were unsure whether or not this meant that the Bill would pay the University for the portion of the meals and housing component of the mandatory program fees. Upon further investigation by these veterans, they learned that, because it is a mandatory fee that all students, veterans and non-veterans alike, are required to pay, the VA would pay the entire program fee.

The veterans who enrolled in the next class did so assuming they would receive the same benefits. However, after the first three courses were completed, the VA determined that the books, meals, and lodging costs that are included in the mandatory program fees could not be paid since the veterans were receiving a book stipend and a housing allowance directly. Consequently, these veterans were faced with an unanticipated out-of-pocket cost of several thousand dollars that might well have affected their enrollment decision. Because these costs were unanticipated and posed a financial hardship on the veterans, the academic units that partner to provide the Accelerated Master's Program in Systems Engineering elected to award a taxable fellowship to each of the affected veterans equal to one-half of the unexpected funding gap. These funds were not applied to tuition and the veterans were still responsible for any balance in tuition due after receipt of VA benefits.

The veterans expressed their appreciation for the University's help in providing fellowships. One veteran wrote "thank you for obtaining this fellowship for us. In times of

financial uncertainty such as these, it is greatly appreciated that you, and the university, are willing to share the burden. I think it is important to note that these kinds of actions from the school only strengthen the veteran-alumni bond.”

University of Virginia does not anticipate offering this fellowship to future cohorts since they will be aware of the VA educational benefits under the Post 9/11 GI Bill.

Insights and Observations

The AMP-V pilot project provided a number of insights regarding how best to proceed in helping transitioning military prepare for careers that can contribute to our nation's STEM capability and, in particular, our need for well trained systems engineers. Key insights are

- 1) Veterans are solid members of the learning cohort because veterans add to the experience of the cohort and are typically highly motivated, self-disciplined and committed to completing the program successfully.
- 2) Recruiting veterans into the admissions pipeline and into the program is challenging. The mathematics background required for AMP is a significant obstacle. The service academies typically prepare graduates for the program but other veterans are less likely to have the required academic background unless they received an undergraduate degree in engineering or science. Consequently, aligning the AMP-V with undergraduate or other complementary programs that prepare veterans for advanced degrees may be necessary to sustain the flow of veterans into the program. For veterans who lack a college degree and are interested in a technical career, the path through an undergraduate and graduate engineering program may be prohibitively long and unaffordable.
- 3) As currently delivered, AMP-V requires students to live within a 2-3 hour drive of Charlottesville, Virginia. Making the program more accessible to more qualified veterans may require introducing a hybrid program delivery format that reduces the burden on veterans to travel to University of Virginia for all classes. A combined format that includes online courses may make the program more attractive and accessible to a larger number of veterans who want to pursue an advanced degree in systems engineering.
- 4) The accelerated pace of the program is appealing to many veterans as it allows them to complete the degree quickly and minimize the amount of their education benefits used in completing the program; however, the relative inflexibility of the schedules requires all students to enter the program at the same time and if a transitioning veteran cannot enroll when the program begins (typically in late May), they must wait another year before another opportunity to enroll is available.
- 5) Base Realignment and Closing (BRAC) will likely result in a realignment of military personnel who might find the AMP-V appealing. Traditionally, the Army Engineer School with its technical support cadre and staff, a reasonable market for AMP, was at Ft. Belvoir, Virginia, easily within the 2-3 hour drive to Charlottesville. Now the Engineer School is at Ft. Polk, LA. Other changes will affect access to AMP-V as well as the places transitioning veterans may choose to settle as they leave military service.

- 6) Continued outreach and recruiting through the West Point Alumni Society in Washington, D.C. and the Naval Academy Alumni group in Central Virginia shows promise as does the VMI alumni groups in Virginia. Each of these groups provide access to qualified veterans who are likely to have both the required academic background and may be within geographic proximity of University of Virginia to make AMP-V a viable option as they transition from military service into the civilian workforce

¹ National Science Foundation, “Veterans’ Education for Engineering and Science - Report of the National Science Foundation Workshop on Enhancing the Post-9/11 Veterans Educational Benefit,” funded under a grant from the National Science Foundation (Award number 0925832), McLean, VA April 13, 2009.

² D. E. Heller, R Hendrickson, K. Griffin, T Timmerman, C Gilbert, “Veterans’ Education in Science and Engineering: Evaluation Design,” working paper No. 9, supported by a grant from the National Science Foundation, Directorate for Engineering, Division of Engineering Education and Centers (#30958290), The Pennsylvania State University, July 2011.