Translating United States Military Occupational Specialties Training into College Credit at a Regional, Comprehensive University

Dr. George D. Ford, Western Carolina University

Dr. George Ford P.E. is an associate professor in the Construction Management Department at Western Carolina University.

Janet C. Ford, Western Carolina University

Janet Ford, Juris Doctor, is an Assistant Professor in the College of Business at Western Carolina University and teaches in the area of business law.
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Abstract

The primary federal military organizations in the United States (US) are the Army, Marines, Navy, Air Force, and Coast Guard. The occupational training programs provided by these five organizations have reputations of excellence, and service veterans are often sought out by American employers due to the excellent training they receive, along with their service experience. The current momentum of re-enlistments in the services is declining [7, 11], and large numbers of service members will be seeking academic credentials to combine with their military experiences for professional advancement in civilian occupations after they leave the military. Since a number of military training programs cover STEM subjects, administrators of STEM-based programs may be able to increase enrollment in their programs by targeting recruiting activities at service members trained in STEM-containing occupational programs. To facilitate recruiting activities, administrators should be familiar with options for awarding college credit to veterans who have both training and experience in subjects covered by STEM programs.

This paper is a primer which will assist administrators of STEM programs in providing support for veterans seeking to further their education, and presents an example of the process to evaluate military training for college credit at a regional, comprehensive university, along with general observations drawn from the example. While both active duty service members and veterans may wish to leverage their military training into college credit, this article focuses on veterans. Active duty personnel present issues, such as deployment and relocation, that generally do not affect veterans, and they are likely to be participating in ongoing training programs.

Introduction

Governmental support for and encouragement of science, technology, engineering, and math (STEM) education and innovation continues to drive recruitment of promising students into post-secondary STEM programs. Also, with the success of post-secondary programs being increasingly measured by retention and graduation rates, those programs will benefit by recruiting students who are well-positioned to succeed. Because of their access to financial resources, heightened maturity, experience, and habits of self-discipline, veterans present an attractive pool of candidates for a wide variety of post-secondary programs.

The current and projected population of veterans is also extremely diverse, presenting a wide range of backgrounds and experiences. The current population of veterans in the United States (US) is approximately 22 million [19] out of a total US population of 319 million [6]. While the current projection of the overall veteran population is predicted to decline gradually over the next thirty years, the number of female veterans is expected to increase during the same period [15]. Projected veteran populations based upon race and ethnicity show a declining, but still significant, population of African Americans and an increasing population of Hispanic and
Latino veterans [16]. STEM program administrators seeking to boost traditionally underrepresented demographics should consider seeking out veterans from STEM-related occupational specialties.

Veterans seeking to obtain a college degree will be supported in their academic endeavors by funding from the Post-9/11 Veterans Educational Assistance Act of 2008 [14], popularly referred to as the Post-9/11 GI Bill. The Post-9/11 GI Bill provides financial support for the educational aspirations of current and future veterans. A veteran who served at least 90 days and was not dishonorably discharged is eligible to receive up to thirty-six months worth of benefits that include tuition and fees, a housing allowance, and a stipend for books and supplies [14]. As state and federal governments in the US continue to cut funding for higher education, tuition costs will continue to rise. Universities must recruit students who can pay a higher proportion of the costs of their college educations without accruing onerous student debt obligations. Students who graduate with high levels of student loan debt are at a disadvantage compared to those students who enter the workforce with little or no debt [19]. The availability of Post-9/11 GI Bill benefits makes veterans attractive candidates for college admission and enhances their likelihood of success, as educational funding is not as heavy a financial burden as it is for students without access to such benefits [3].

Military veterans possess other attributes which foster success at the post-secondary level. The typical veteran is older than a freshman entering college just after high school. He or she is more mature, having experienced at least one tour of service for three or four years. His or her military training has included lectures, coursework, and field experience. A veteran has practiced a style of living and working that demands discipline, and may have acquired both rank and managerial experience [8]. For these reasons, veterans are often more successful in college than the general population [13].

Mature, academically prepared, disciplined, and well-funded veterans should be highly sought after prospects in any post-secondary science, technology, engineering, and mathematics (STEM) educational arena. Veterans who, by virtue of their military training and experience are well positioned to enter these fields should be even more prized as student candidates. One factor in attracting qualified veterans to a STEM program is the degree to which those veterans can leverage their training into college credit. Requiring veterans to enroll in courses in subject areas where they already have training does not benefit the veterans, nor is it an effective use of tax dollars which are spent once in providing the military training and then again when the veteran draws on Post-9/11 GI Bill benefits to pay for duplicative coursework.

This article introduces administrators at STEM-offering institutions to the basics of military rank and occupational specialties and to the evaluation of military training by the American Council on Education (ACE). First, this article provides a general review of the rank structure of the primary US military organizations and continues with a brief discussion of STEM-related military occupational specialties and training. Next, this article explains the role of ACE in reviewing and evaluating military training courses for purposes of recommending college credit. Finally, this article analyzes and presents observations of a sample of military transcripts received by a regional comprehensive university and concludes with suggestions for further
research with an emphasis on transferability of STEM-related military training to post-secondary education.

**Rank structure**

Generally, the five primary US military organizations have the same rank structures. There are enlisted ranks E-1 through E-9, warrant officer ranks WO-1 through WO-4, and officer ranks O-1 through O-10, in addition to a few special ranks [1, 4, 5, 12]. The enlisted ranks are the privates, seamen, or airmen through sergeant or petty officer. An E-1 is the lowest private, seaman, or airman for the Army and Marines, Navy, and Air Force, respectively. Corporals, sergeants, and petty officers are enlisted ranks, but are sometimes referred to as noncommissioned officers (NCO) and start at E-4. The most senior NCOs are E-9s. In a very general sense, enlisted ranks enter the service as E-1s, and can work up to an E-8 in 20 years. Service members who leave the military after their first tour of three or four years will achieve a rank of E-4, on average. Likewise, service members who retire from the military after twenty years or more will earn the senior ranks of E-8 or E-9. Senior enlisted service members will be more highly trained than the junior enlisted ranks, and also will generally have more management and supervisory experience.

The warrant officer ranks, WO-1 through WO-4 are typically specialists in their occupational areas. For example, the Army uses warrant officers in the aviation field as helicopter pilots. The Air Force is the only service which does not use the warrant ranks. Warrant officers are considered officers, but rank below commissioned officers and above the enlisted ranks. In general, they will be among the most highly trained service members, often possessing a college degree, extensive military training and extensive management experience.

The commissioned officer ranks, O-1 through O-10, are the lieutenants through the admirals and generals. Officers at the O-1 level are lieutenants in the Army, Marines, and Air Force, and ensigns in the Navy. In a typical four year tour of duty, an officer will be promoted to the rank of O-3, which is a captain in the Army, Marines and Air Force, and a lieutenant in the Navy. Generally, there are three ways to become a commissioned officer. The most common path to a commission is through the Reserve Officer Training Corps (ROTC). College students enrolled at an institution with an ROTC program complete basic military training in addition to their academic program of study. ROTC appointed officers will generally earn their undergraduate degree before they are commissioned. A second path to a commission is Officer Candidate School (OCS), where a soldier, marine, seaman, or airman attends and completes a specific military training course. Frequently, a college graduate will enter the service in an enlisted rank without having completed an ROTC program, and will attend OCS to become an officer. Finally, attendance at the professional military academies such as Annapolis (Navy) or West Point (Army) will lead to a commission upon graduation. In general, most officers will possess a bachelor degree. Many in the more senior officer ranks, O-4 or above, will possess a master degree. An officer will typically earn the rank of O-5 in twenty years of active service.
Occupational specialties

Each of the primary military organizations offers twenty-two career fields which, in turn, contain many occupational specialties that require specific training. The career fields are:

1. Accounting, Budget & Finance
2. Arts, Communications, Media & Design
3. Aviation
4. Business Administration & Operations
5. Combat Operations
6. Communications Equipment Technologists & Technicians
7. Construction, Building & Extraction
8. Counseling, Social Work & Human Services
9. Engineering & Scientific Research
10. Environmental Health & Safety
11. Health Care Practitioners
12. Human Resources Management & Services
13. Information Technology, Computer Science & Mathematics
14. Intelligence
15. International Relations, Linguistics & Other Social Sciences
16. Law Enforcement, Security & Protective Services
17. Legal Professions & Support Services
18. Mechanic & Repair Technologists & Technicians
19. Medical & Clinical Technologists & Technicians
20. Naval & Maritime Operations
21. Personal & Culinary Services
22. Transportation, Supply & Logistics

[9]

Many of the occupational specialties within these career fields are in STEM related disciplines. Among the almost 200 Army occupational specialties are a number of technology and engineering careers, such as Biomedical Equipment Specialist, Chemical Operations Specialist, or Construction Engineering Supervisor, to name just a few [4]. Likewise, the Marine Corps offers specialties such as Chemical, Biological, Radiological, Nuclear Defense Specialist, Aircraft Communications/Navigation/Radar Systems, and Cyber Network Operations Engineer among its hundreds of occupational specialties [17]. The Navy devotes an entire section of its website to its STEM-related occupational specialties, touting “highly technical careers with advanced training in everything from engineering to aviation, health care to information technology” [12]. The Air Force maintains a careers website that lists and defines occupational specialties by areas of interest, such as Computers & Computer Science, Engineering & Applied Science, Future Technologies, and Natural Science [1]. A review of the Coast Guard website reveals a sample of STEM-related occupational specialties as well: Electronics Technician, Information Systems Technician, and Marine Science Technician [5].

There are hundreds of jobs available to service members, and each requires specific training and many have prerequisites. Prior to entry into military service, recruits complete the Armed Services Vocational Aptitude Battery (ASVAB) [4]. As its name suggests, the ASVAB identifies
occupations for which the recruit is best qualified, and it is used by the military organizations in much the same way that post-secondary institutions utilize SAT or ACT scores. Qualification for the Army’s Biomedical Equipment Specialist, for example, requires a certain minimum score on the ASVAB, at least one year of high school algebra, and completion of the relevant Army training course associated with this specialty [4].

The American Council on Education

According to their website [2], the American Council on Education (ACE) is the nation’s most visible and influential higher education advocacy association. Their member institutions represent US accredited, degree-granting institutions, which include two- and four-year colleges, private and public universities, and nonprofit and for-profit entities. ACE provides a College Credit Recommendation Service as a means for individuals to obtain credit for formal training in workplace and military settings that takes place outside of traditional degree programs. Since 1945, ACE has utilized panels of post-secondary educators to review military training programs and experiences for the purpose of recommending college credit. These panels review course objectives, training materials, assessments, and contact hours to determine whether the training merits college credit and if so, in what discipline, how much and at what level [2]. ACE produces a publication, The Military Guide [10], which contains its credit recommendations. The Military Guide may be searched by a variety of parameters, including by military course number or even more generally by subject. A typical course listing contains the name of the occupational specialty, where the training takes place, the duration of the training, the learning outcomes, instructional methodologies, related competencies, if any, and finally a recommendation for credit. Credit recommendations specify the level (e.g., lower division baccalaureate) and the number of hours suggested by subject [10].

Military veterans may receive college credit from a college or university for their military training and experience based upon the credit recommendations in the Military Guide. ACE’s credit recommendations also appear on a veteran’s Joint Services Transcript (JST), which lists all of the veteran’s training, including the dates and descriptions of that training. A JST is generated by the veterans’ branch of service, upon the request of the veteran, and may be evaluated by institutions the same way college transcripts are evaluated for transfer students.

Sample application of military transcript review

Located in the extreme western part of North Carolina, Western Carolina University (WCU) is a regional comprehensive university and one of the seventeen campuses of the University of North Carolina (UNC) system. In addition to being an ACE member institution and accepting ACE credit recommendations, WCU has articulated an agreement with military officials at Fort Bragg to grant college credit for military training in the emergency medical occupations. While this may not be a classic STEM program, an application of JST reviews in this field illustrates how similar reviews could be conducted in STEM programs, and also generates some observations about the level and amount of credit that is typically awarded.

Typically, veterans will apply to WCU for admission by providing transcripts for their past academic work as well as their JSTs. At WCU, the Director of Military Programs (DMP)
evaluates the JSTs to determine transfer credit, often in consultation with specific program administrators or faculty, and, once approved by the relevant administrators, communicates her assessment to the Registrar. WCU’s articulation agreement with Fort Bragg officials has enabled the DMP to streamline this process for applicants to WCU’s Emergency Medical Care or Emergency and Disaster Management programs. However, JST evaluation for candidates to other programs tends to be more ad hoc.

WCU’s experience with JST evaluation has shown that, at least initially, the process for determining program specific transfer credit for veterans can be time consuming and inconsistent. Program administrators and faculty with military experience may be inclined to liberally accept transfer credit from the JST. Administrators and faculty with little or no military experience may be less inclined to accept credit for military courses and experience. At WCU, most faculty and administrators do not have military experience. Some administrators cite accreditation issues (although numerous accrediting bodies are ACE members), and the process is often very subjective. Further complicating JST evaluation is the fact that there is not always a one-to-one equivalency between a military training course and a particular academic course.

The UNC system is in the process of implementing a legislative mandate to develop a process for granting academic credit based upon relevant military training and experience. Faculty and staff at UNC and North Carolina community colleges will serve on a Military Credit Advisory Committee, which will work with state institutions to “facilitate the creation of a transparent and accessible system for informing students with military credit on how this credit would transfer to any North Carolina Community College or UNC university.” [19] Additionally, WCU is assembling its own Military Advisory Committee to facilitate the integration of military students into institutional planning, which will no doubt include, among other things, a more consistent process for evaluating military training for academic credit. Until statewide and institutional committees develop and state institutions implement a coordinated process, however, the JST evaluation process will continue to be challenging.

The following paragraphs illustrate how the JST evaluation process has been applied at WCU.

**JST Reviews**

Sixty JSTs, stripped of identity information, were randomly chosen from the files of the DMP to determine patterns in the types and quantities of credit recommendations and awards. The JSTs were then separated by service and rank. The sample composition is shown in Table 1 below:

<table>
<thead>
<tr>
<th>Rank</th>
<th>E-2</th>
<th>E-3</th>
<th>E-4</th>
<th>E-5</th>
<th>E-6</th>
<th>E-7</th>
<th>E-8</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army</td>
<td>2</td>
<td>4</td>
<td>15</td>
<td>7</td>
<td>12</td>
<td>8</td>
<td>5</td>
<td>53</td>
</tr>
<tr>
<td>Navy</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Coast Guard</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Marines</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>2</td>
<td>6</td>
<td>15</td>
<td>10</td>
<td>13</td>
<td>9</td>
<td>5</td>
<td>60</td>
</tr>
</tbody>
</table>
The JSTs in the sample contained numerous military courses for which no credit was recommended. Where credit was recommended, the hours of credit recommended typically increased with rank, see Table 2 below:

<table>
<thead>
<tr>
<th>Rank</th>
<th>E-2</th>
<th>E-3</th>
<th>E-4</th>
<th>E-5</th>
<th>E-6</th>
<th>E-7</th>
<th>E-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Army</td>
<td>6</td>
<td>15</td>
<td>23</td>
<td>36</td>
<td>70</td>
<td>80</td>
<td>181</td>
</tr>
<tr>
<td>Navy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34</td>
</tr>
<tr>
<td>Coast Guard</td>
<td></td>
<td></td>
<td>89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marines</td>
<td>105</td>
<td></td>
<td>83</td>
<td></td>
<td></td>
<td></td>
<td>270</td>
</tr>
</tbody>
</table>

Almost all credit recommendations were for lower division coursework and would be considered elective credit at most universities and programs. There was a JST for an Army warrant officer and an Army captain. They had already earned undergraduate degrees and would not generally be candidates for a second undergraduate degree. The captain’s JST, however, contained a majority of upper division ACE credit recommendations.

Most of the JSTs in the sample were in the Army Combat Operations occupational fields, and typically contained the fewest hours of credit recommendations of any kind. JSTs with medical job specialties generally contained the most credit recommendations when compared to other occupational specialties, which would be expected to the extent that the JSTs were submitted by candidates for admission to WCU’s Emergency Medical Care or Emergency and Disaster Management programs. Physical Conditioning, Military Science, Leadership, and Supervision were typical course recommendations for ranks above E-3. Credit recommendations of any kind were few to none for E-1s to E-3s, see Table 2 above. Initial entry training in the Army is recommended for six semester credit hours, including land navigation, marksmanship, physical fitness, self-defense, and first aid. While many colleges and universities have a physical fitness course requirement, the remaining courses would be elective credit in most programs.

As would be expected, the amount of credit recommended by ACE increased with rank. Many of the JSTs for senior NCOs reflected work in multiple occupational fields during their military enlistment. JSTs of senior NCOs in the sample contained substantial hours of credit recommendations: averaging over 150 semester hours. Much of this credit was recommended in military specific areas such as Military Science, Marksmanship, or Military Operations, which are of limited relevance in most academic programs.

Almost all of the credit recommendations were for lower division, freshman or sophomore level credit. This fact is relevant when considering general studies coursework, which is often a substantial portion of a 120 semester hour, four year program. General studies programs often contain math, English, science, humanities, and liberal arts courses. Much of the credit recommendations in the JST sample would apply to general studies coursework and perhaps fundamental coursework in specific disciplines.
Conclusion

Military veterans present an untapped pool of potential STEM students that deserve consideration. They receive excellent training and experience in a wide variety of subjects, they bring maturity and diverse backgrounds and experiences to the classroom, and they have access to financial support resources to advance their education. The military and ACE have partnered to develop, improve, and evaluate military training with an eye toward facilitating completion of post-secondary degrees. There is a wealth of information available to administrators through both the military and ACE to assist them in determining whether and how much college credit should be awarded to veterans. While these observations hold true in many academic disciplines, they could be especially relevant to administrators of STEM programs as they seek to fulfill their mandate to promote education and innovation in STEM fields.

This article presented a basic discussion of military organizations and a very brief sampling of STEM-related occupational specialties. The success of veterans in STEM-related occupational specialties in academic STEM programs certainly merits further exploration. WCU, with its location and status as a regional comprehensive institution, may not be the destination of choice for veterans with a STEM background. However, its experience with military transcript review does provide some useful observations. Generally, it could be anticipated that reviews of the JSTs of veterans would result in an award of at least freshman and sophomore credit in foundational or general studies courses, especially for veterans who have earned the rank of E-4 or higher. Although ACE does occasionally recommend graduate-level credit for certain military courses, this is the exception and not the norm. While the JST review process may initially be cumbersome for those unfamiliar with military training or ACE evaluations and recommendations, the process should become more consistent and predictable as administrators and faculty become more aware of the benefits of the contributions that veterans can make to the academic environment. North Carolina’s current initiative of developing and implementing a consistent statewide process for evaluating military training for academic credit will be worth watching for lessons learned.

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