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Student Veteran Engineers and Academic Libraries: A Review of Recent Literature

Mr. Paul McMonigle, Pennsylvania State University

Paul McMonigle is the Engineering Instruction Librarian at the Pennsylvania State University. He holds a Master's of Science Degree in Library and Information Science from Syracuse University and is in the final year of earning a Master's Degree in Education from Penn State. His research interests include information literacy instruction for STEM students, student engagement and outreach programs – with a special focus on military and veteran students, and the early history of libraries. He is a member of the 2023 American Library Association Emerging Leaders Cohort.

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ABSTRACT

Since the Post-9/11 G.I. Bill was passed by Congress in 2008 and implemented in 2009, over 750,000 veterans have used its expanded benefits to obtain or extend their education. However, academic librarians have only recently begun to fully conduct research on this population and its needs, both inside and outside the classroom. This process is made even more difficult by the fact that more than half of all student veterans are receiving their education through virtual or online programs. To the author's knowledge, there has been no significant attempt to conduct an in-depth review of the literature that has been published since the passage of the bill. This paper reviews recent studies published about the educational choices and preferences of student veterans. It will also look at current research on the experience of veterans in STEM (Science, Technology, Engineering, and Mathematics) majors. Finally, there will be an assessment of outreach programs and other events sponsored by academic libraries for this often-overlooked population, with a focus on events designed to encourage or assist STEM student veterans. Trends, successes, and failures will be noted. The intent is to understand the needs of veteran students, as well as learn what has been done by librarians in the past, so that college and university libraries across the country are better able to plan, implement, and assess potential outreach and assistive programs for veterans on their campuses, both residential and virtual.

INTRODUCTION

Since World War II, there have been several "G.I. Bills" passed by Congress to provide benefits for veterans of America's wars. The first, officially known as the Servicemen's Readjustment Act of 1944, included low-cost mortgages and loans, a year of unemployment compensation, and (most importantly) dedicated tuition and living expenses for veterans attending college. By 1956, when the act expired, over 2.2 million veterans had successfully used the G.I. Bill to attend the college of their choice [1].

In 1984, the program was revived as the "Montgomery G.I. Bill", named after its primary sponsor, Mississippi Congressman Sonny Montgomery [2]. Unlike the original bill, active duty servicemembers had to pay into the system during the first twelve months of service, received a maximum of $1564 per month for educational spending, and had a 10-year time limit after separation to use the benefits [3].

In the summer of 2008, Congress approved a major expansion to veterans' educational benefits. Known as the Post 9-11 G.I. Bill, these included the full cost of tuition of any public college in their home state, a housing allowance, and a $1000-a-year stipend for books and materials. The time limit was extended to 15 years for veterans who separated before January 1, 2013, while those who were discharged after that date have no expiration date for their benefits. The bill went into effect on August 3, 2009, and since that date, over 750,000 veterans have used it to obtain or extend their education [4].

As the number of student veterans has increased on college campuses across the country, both in person and virtually, college and university libraries have tried to create outreach programs and

other events to engage with this population and help ensure their success. However, the needs and expectations of student veterans are often quite different than those of most students who attend college right out of high school and are even different than most other "adult" learners. Therefore, librarians have had some difficulty with successful outreach.

This paper is an attempt to both better understand those needs and expectations while also learning how libraries have been successful (or not) in reaching out to the student veterans on their campuses. By looking at the published literature of the last 10 years, the author hoped to gain enough knowledge to begin planning an engagement plan of their own.

METHODS

Although the literature review was not officially "systematic," the author loosely followed the meta-narrative model set forth in Page and Thomas' 2009 review of qualitative research methods [5]. To ensure that the steps were properly followed, the work of Newman and Gough [6] was instrumental for the completion of this review.

The basic question meant to be answered by the review was twofold – what are the needs and expectations of student veterans and what have academic libraries done to meet them? This question set the criteria for the review. These criteria specified that the literature in review was limited to studies on student veterans in university settings, with a focus on those in STEM majors. To answer the second question, any study that focused on the student veteran experience in academic libraries would be included. Also, all relevant literature had to be published after 2012 to allow enough time for the new G.I. Bill to influence education.

The literature search used the following sources:

- Engineering Village (Compendex and Inspec)
- IEEE Xplore
- ERIC: Education Resources Information Centre
- LISA: Library and Information Science Abstracts
- LISTA: Library, Information Science & Technology Abstracts
- Scopus
- Citation Checking of all literature found from above.

Keywords used for the search were:

- "student veteran" OR "student veterans" OR "veterans" AND "academic librar*" OR "college librar*" OR "university librar*" AND "engineering" OR "STEM"
- "student veteran" OR "student veterans" OR "veterans" AND "academic librar*" OR "college librar*" OR "university librar*"
- "student veteran" OR "student veterans" OR "veterans" AND "engineering" OR "STEM"

The use of the second and third search strings was due to extremely low results from the first search. Any study that met the selection criteria mentioned above was retained for further

examination. Those papers were then critically appraised for quality, relevance, and appropriateness for this review.

RESULTS

As expected, only a small number of studies were found that were relevant to this review. Out of the twenty-three that will be discussed further in this paper, nine were discovered by checking the citations of those found in the reviewed databases. Table 1 shows the results of each search run, including the total number of papers found and the total that were relevant after checking for duplicates.

Database	Number of Results	Number of Relevant Results	Number after Appraisal
Engineering Village	43	11	1
IEEE Xplore	8	0	0
ERIC	81	4	1
LISA	158	66	13
LISTA	15	0	0
Scopus	225	33	8
Totals	530	114	23

Table 1: Search Results by Database

As will be seen in the discussion below, the author divided the reviewed papers into three categories: "veterans as college students," "veterans experiences in STEM," and "academic libraries and veterans." By using these topics, a narrative of what student veterans expect from their libraries and how those expectations can be met shall be created and understood.

LIMITATIONS

One limitation of this review is that neither data mining nor a machine learning process was used during the search. This may have increased the number of articles found, though it may have also returned more false positives. The reason for ignoring these tools was because the author is still learning how to utilize them for research.

The review only included publications up to the summer of 2022. It is possible that research has been conducted and published since then that is relevant and would be incorporated into future analyses. This study was also mostly limited to peer-reviewed journal articles and conference proceedings. Academic blogs and other forms of literature did not make the cut.

DISCUSSION

Veterans as College Students

There is no official accepted definition for the term "veteran." For example, many states do not consider their National Guard members as veterans unless they deployed into a designated combat zone. Universities, states, and the Department of Veterans' Affairs all have different definitions, which often connect with whether someone is eligible for certain benefits, such as the G.I. Bill. To be as inclusive as possible, most institutions of higher education define a veteran as anyone with military service, no matter if it was active, reserve, or Guard. Currently serving members of the military are often included as "future veterans" [7].

The biggest difficulty veterans must overcome to be successful as students is the difference in culture between the military and higher education [7]. Even compared to American society in general, higher education has a unique culture that is diametrically different than that of the military [7-11]. Compared to the average college student, veterans are more confident in their abilities and will take the initiative to solve their problems and seek out help when necessary [7-8].

The primary reason veterans attend college is the same as the general population: to improve their lives and that of their families by earning the credentials needed to obtain a decent job upon graduation [7, 9-10]. The biggest obstacle they run into is the same one shared by their fellow students – cost – but the Post-9/11 G.I. Bill has reduced this to an almost meaningless level [7]. Many attend colleges and universities that are near the bases where they served, with the result being that student veterans are highly concentrated in states with major bases, such as Texas, Florida, California, Virginia, Georgia, and North Carolina [7].

Veterans are considered "non-traditional" students since they usually have a gap of at least three years since leaving a formal educational environment [10]. Due to having to transition back to civilian life after several years in the military, student veterans can have problems that other students never have. These can include navigating the VA bureaucracy, understanding and applying their benefits, addressing family issues, lack of patience with the younger students around them, problems with mental health and depression, and identity issues. These can be combined with the problems that most college students face, creating additional layers to an already high-stress experience [10-11]. Female veterans can run into additional issues as well that are unique to them [12].

Veteran Experiences in STEM

This is one topic that has been well-researched over the past decade, with many publications on various issues with student veterans in STEM (primarily engineering) to review. However, since the focus of this literature review is on academic libraries, not engineering schools, departments, or colleges, it was decided to only include a couple overviews to provide the proper perspective. This accounts for the significant difference between "relevant results" and "appraised results" in the table above.

Veterans often develop abilities to manage technical skills during their time in service that are valuable to engineering practice, such as electronics or mechanical skills, teamwork, leadership, and communication [13]. Unfortunately, many colleges and universities designate military service as physical training only and do not give course credit for the job-specific training most veterans complete. This has the effect of turning away many veterans who could be excellent engineers [13].

Engineering student veterans have reported that the military's mandatory transition assistance program (TAP) has not really been useful for those who plan to attend college immediately after separation, especially engineering majors. The focus is primarily on finding a job, which they really are not worried about for another four years or so. Most have mentioned that they choose engineering instead due to comments from supervisors or because of their duties while they served [13-14]. In fact, those who had some engineering training or experience in the military found the transition to academic study relatively seamless. The student veterans who cited any academic difficulties stated that the math and computer science requirements were the most troublesome [14].

The best one sentence summary the author found was in Sheppard, et.al. (2018), "Due to extensive training, operations, and experiences that 99% of the people living in the United States have never encountered, veterans in engineering have the capacity to bring new skillsets, thought processes, and problem-solving techniques to the engineering community." [8]

Academic Libraries and Veterans

Most of the studies reviewed to be included in this paper were on the topic of student veteran experiences in academic libraries. Most of the recent research into how academic libraries can better serve student veterans has been conducted by librarians who are veterans themselves or closely related to a veteran. Although this could be seen as creating a "bubble" where information stays within the community, all the papers cited in this section have been published in major library science journals, showing that there is an interest in helping student veterans in general amongst the larger academic library community.

Several librarians have brought up that to properly help student veterans succeed, it is imperative to collaborate with other units on campus, especially if the institution has an Office for Student Veterans or similar organization [15]. Outreach directed specifically towards student veterans can demonstrate that they have a place in the library alongside the other, traditional students [16].

Some other ideas for engagement include [15]:

- Promote the library's services through social media and campus Web sites visited by student veterans, including veteran support services and student veteran organizations [16].
- Promote the library's Web site and add a special welcome statement for student veterans.
- Visit the campus student veteran office and offer specially designed library services, onsite and/or at the library [17-18].

- Establish a network among other campus academic/student services departments and form a discussion or interest group [19-20].
- Circulate mobile devices that are programmed with apps specific to the academic and personal needs of student veterans.
- Identify student veteran-specific courses or workshops and offer to speak about the library's services [16-17, 20].
- Create displays that commemorate national holidays, such as Veteran's Day [16, 21].
- Schedule a library open house or reception for student veterans [18, 20].
- Create special libguides for veteran students [16, 18].
- Attend the university's educational programs related to student veterans [18, 20].
- Organize library staff development programs that describe and celebrate student veteran diversity [19].
- Collaborate with veterans to create an oral history project or special exhibits [20-21].
- Store, archive, and preserve materials that pertain to the experiences of student veterans [22].

When teaching, it is wise to remember that many student veterans prefer to sit in the back of the classroom next to the wall to maintain their situational awareness [16]. Many are accustomed to a systematic approach to instruction known as "standard operating procedures" (SOP) and may not feel initially comfortable with more creative learning environments. However, in general, student veterans are very adaptable and can adjust quickly. Providing real-world examples for how information literacy skills can be applied outside the classroom, which is something they are familiar with, will help with the adjustment process [16]. Many veterans have reported that they found librarian visits to their courses to be a valuable experience [18].

While conducting research, student veterans are very self-motivated, efficient, and unafraid to seek out subject matter experts when necessary. This includes librarians, especially when trying to find information that supports their projects and lab work [18]. When collaborating one-on-one with them, librarians should treat them as adult students, even if they are the same age as their non-veteran classmates [18].

For collections development and maintenance, having a centrally located compilation of materials and resources useful for student veterans can go a long way towards making the library useful and relevant to this population [23]. This can be a combination of physical and electronic sources, with an online libguide to help students navigate everything. It is important to place an emphasis on fiction and memoirs that focus on their experiences [23-24].

Libraries can also create special orientation events to cater to the needs of student veterans. Activities can include tours of the library space (both in person and virtually), overviews of how to conduct searches for books and journal articles, how to access materials online and at a distance (for remote and online students), and how to find and check out maps and GIS software [25].

Student veterans use library space and resources no differently than traditional students. Different surveys have found that studying is the most common reason for veterans to be in the library, with computer use and relaxing/socializing near the top. Again, veterans are extremely

comfortable with asking for help from the reference and circulation desks if needed and appreciated when library employees treated them respectfully. Some libraries have even created special lounges and study areas to be used specifically by student veterans [26].

One other way librarians can support student veterans is through partnerships with student organizations. An example can be found at Texas A&M University and the library's collaboration with the Aggie Shields organization. Aggie Shields is a student group founded to support student veterans by providing easy and free access to textbooks. They worked with the Veteran Liaison Librarian to create a team that included catalogers and members of the preservation department. They all worked together to make the textbooks in their collection easier to search for (both online and in person), repair any damage, and ensure that there was enough space in the library to store everything. This collaboration led to both an increase in usage of the textbooks and an increase in student veteran use of the library [27].

A similar textbook reserve project came out of a collaboration between the official student veterans' group and the library at the University of Memphis. In this case, however, ownership of the materials shifted from the organization to the library. Care was taken to store the books separately from other course reserves and catalog them as their own special collection within the library, so that only veterans would continue to be able to use them [28].

One last group that has been overlooked until very recently has been creating services for the dependents of student veterans. A study at Texas A&M University[1] was conducted to determine whether dependents could benefit from specialized services and if so, which services to include. After compiling the results of surveys sent out to the community, it was found that most dependents are remarkably close in age and experience to the average traditional student and regular outreach methods would collaborate with them as well. Military spouses, however, were found to be an incredibly unique group, with special needs that could only be fulfilled by targeted programming. Additional research is needed [29].

FUTURE RESEARCH

The next steps in this study are to conduct two surveys. One survey is for engineering librarians at major universities with veteran students to determine what programs, if any, they currently have in place or are planning soon. The other survey is for student veterans at the author's own institution, to better understand the local climate within the community. With the results of the surveys, we can begin planning an ongoing outreach program, in collaboration with the institution's Office of Student Veterans, to ensure that student veterans in STEM fields have the support and encouragement they need to successfully complete their majors and graduate into the workforce to start their new careers.

Due to the lack of research on how student veteran engineers use the library, further studies are necessary. Once the general outreach program mentioned above is implemented, there will be an opportunity to delve deeper into the needs and expectations of this group.

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[1] The library at Texas A&M has been at the forefront of conducting research to assist and improve the experience of student veterans.

CONCLUSION

Thanks to the many military occupational specialties that focus on technology, electronics, and mechanics, along with the many "soft skills" (such as communication, leadership, and discipline) that are learned along the way, student veterans are excellent candidates for becoming successful engineers. If academic libraries are better able to understand the needs of this population and support these students in their journeys to their degrees, they can become excellent partners with engineering programs to ensure the full success of this group and allow them to continue serving their country and neighborhoods in a new and rewarding way.

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