

# DECISIVE POINT

The USAWC Press Podcast Companion Series

## Podcast Transcript

### BG Leon L. Robert Jr., US Army (retired), and COL Carl J. Wojtaszek, “Closing the Gap: Officer Advanced Education STEM+M (Management)”

The Army has made insufficient progress in arming its officers with science, technology, engineering, mathematics, and management (STEM+M) knowledge. The contemporary battlefield is faster paced, technologically enabled, and data driven, requiring officers to possess more skills, knowledge, and experience. We examine the Army’s history with STEM education and show that, in terms of education, the current Army officer corps has fallen behind its requirements for technology-enabled forces and modern society. We conclude with recommendations on how the Army can close the STEM+M education gap through advances in higher education and adopting talent management practices.

Read the article here: <https://press.armywarcollege.edu/parameters/vol54/iss2/10/>

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Keywords: STEM+M, education, technology, human capital, higher education

#### Episode Transcript

##### Stephanie Crider (Host)

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The views and opinions expressed in this podcast are those of the authors and are not necessarily those of the Department of the Army, the US Army War College, or any other agency of the US government.

Joining me today are Brigadier General Leon L. Robert Jr., US Army (retired), PhD, and Colonel Carl J. Wojtaszek, US Army, PhD, authors of “Closing the Gap: Officer Advanced Education STEM+M (Management),” which was published in the Summer 2024 issue of [Parameters](#).

Robert is a professor of engineering practice at the Davidson School of Chemical Engineering and the Purdue Military Research Institute at Purdue University and a professor emeritus of the United States Military Academy.

Wojtaszek is an academy professor and director of the economics program at the United States Military Academy.

Welcome to Decisive Point, Leon and Carl.

What inspired you to write this article?

##### Leon L. Robert

Each year, the United States Military Academy selects officers to go to graduate school and then go to the academy for a three-year teaching assignment. And, we struggled finding a large enough pool in some years’ recruiting classes to send officers back for STEM degrees. So that got me thinking about why there were so few officers with undergraduate STEM degrees that were eligible to go to graduate school with those degrees. And, in talking more recently with STEM department heads at West Point and the leadership of the Defense Threat Reduction Agency, they’ve seen this trend continue with the lack of officers with undergraduate STEM degrees that are able to go to graduate school and get an advanced degree in some STEM discipline.

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**Host**

Thanks, Leon. Carl, did you want to weigh in on this question?

**Carl J. Wojtaszek**

Sure.

I think one of the things that inspired me was that we have known for a while that education, especially advanced education in the the United States Army officer corps, has decreased over the past 20 to 25 years. Specifically, within the STEM element, you could imagine that’s still increased because the trend toward engineering and STEM degrees could have been increasing—as it has been in the United States over the past decades. The surprising part here is that not only within the United States Army is advanced degrees decreasing, but within the STEM component, it is also decreasing, which is a trend contrary to what we’re seeing in the United States. And I think contrary to what, you know, most national policy is when it comes to increasing the STEM capability within the labor force in the United States.

**Host**

Can you tell me anything else, anything more specific, about what has changed in the past 20 years that led to this trend?

**Wojtaszek**

The Army has constantly had this debate of how engineering-focused should its officer corps be, or how educated its officer corps should be. And that dates back to the very beginning. Over the past 20 to 30 years, it really comes down to a balancing act or an opportunity cost of educating officers once they’re in the force. For every officer that you want to educate that doesn’t pursue or doesn’t already possess an advanced degree in engineering or STEM, it costs you two things to educate them once they’re in the force. It costs you the time that you’re going to pull that officer out of the force and send them to graduate school. That is a reduction in manpower. You lose those service years—and money. Most of the graduate schools are traditionally expensive endeavors. And so, every time you have to send an officer to do those things, it costs you time and money. The last 20 or 30 years, really, since the 1990s, and the peace dividend and a smaller force, has put pressure on the Army when they have to make those trade-offs.

Traditionally, when the Army was large, and it was largely a peacetime army, or at least a Cold War army, sending officers to advanced education did not really cost you a lot of manpower because you had excess officers compared to the jobs you needed them to do. And, the defense budget was much larger when you think about the Reagan years and the Cold War years. After the peace dividend, and then really the 2000s, when we enter the wars in Afghanistan and Iraq, we end up with an officer shortage in the mid-2000s, which really puts a strain on not only the operational Army, but really puts a strain on [Human Resource Command or] HRC and the Army at large (and its manpower policies) to be forward-thinking and being willing to trade off officer strength today in order to send some officers out and get educated, even though they know they’re not filling [brigade combat teams or] BCTs with the number of officers they need.

You’re leveraging the future in order to meet the present. And so, you have both the demand of we need our officers now—so, we don’t have time to send them off to schooling—and then budgets. Most of the budgets were directed to operational needs in Iraq and Afghanistan. And so, the budgets that allowed officers to also go to graduate school were not up to the task of continuing to build an officer corps that had advanced education at the levels that we would probably want it at.

The question of this paper really is now that we are through those wars and the officers corps is no longer in a shortage—or, at least, not nearly the shortage that it was in the mid-2000s—has the Army responded to kind of make up that ground or take advantage of the STEM+ that is available and re-leaven its officer with this education that it potentially needs on a more modern battlefield.

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**Robert**

The part of the equation that I think the Army shortchanges often is the idea that advanced civilian education, i.e. graduate degrees, is a strategic investment in education for the future. We don’t know what the next war is that we’ll fight.

Graduate school enables an officer to explore new and emerging technologies [and] how those technologies may play out in future conflicts and battlefields. Graduate school not only teaches you what to think but how to think. How to think is one of the most important benefits of getting an advanced degree. We need an officer corps that is comfortable with new and emerging technologies and can see how those technologies will provide an advantage in future conflicts.

**Host**

You offer some useful recommendations in your article.

**Robert**

We really have four recommendations for the Army. The first is to increase the use of low-cost or no-cost civilian schooling options. For instance, here at Purdue, we give no-cost fellowships for graduate school education to active-duty military officers. The cost of graduate school is borne equally by the graduate school and the professor that they work under.

They come to Purdue [and] get either a master’s or PhD at no cost to the military. The second recommendation that I think Carl is best to talk about is update current Army education requirements and then decentralize the graduate certificate program education. We think that major commands ought to be given some of that advanced civil schooling monies, where a commander could say, “I don’t have an officer that is educated in,” for instance, “artificial intelligence. So, I need to send an officer off to graduate school to get a certificate in artificial intelligence.”

Many schools offer certificates in many of the emerging technologies. They’re usually four- to five-course sequences. They could take one or two of those courses online and then, perhaps, go for a summer and get a certificate in whatever emerging technology that the command in the unit requires.

I’ll turn it over to Carl.

**Wojtaszek**

Thanks, Leon.

Our four recommendations really focus on the framing of the problem that we have done and trying to address, specifically, that challenge that we think has resulted in a lower-than-ideal level of STEM within the Army. And those are really that manpower and money problem.

I would argue that nobody in the Army, no senior leader, and nobody at HRC is probably happy with the level of STEM or even purposely thought this is the level that we should be at. We’ve gotten here by inches by other demands on the Army.

How do you reduce those barriers or those obstacles? And that’s really what these four recommendations are about.

And on the money side, like Leon just spoke of, a lot of these programs are now free. Schools have an appetite for this. And so, the fact that you can use other people’s money to enhance the officer’s core education, we should leverage that as much as possible.

So, money is no longer the challenge, at least in this environment, where many of these schools will do this for free now.

So, now we’re really talking about the time and incentive problem. When you think about these programs and these certificate programs, they are a much more short duration. Being able to get officers into a unit and then allow that

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unit commander this decentralized education requirement, and the commander who now owns that officer can make the right call on saying, “You know what, I’m okay losing this officer for six months or three months or a year because I need this type of expertise in my unit. And therefore I will bear the cost, the shortage of manpower.” And then they can be sent off to do that and then come right back to that unit. That lessens that window in which the officer is gone.

Some of this stuff can just be done online, initially. So, it may be that officer doesn’t need to leave the unit at all. They just need some afternoons off once in a while in order to complete a program.

And so, now you’ve reduced that manpower requirement for education that has largely prevented the Army from pursuing these STEM degrees that used to take an officer—because it was centrally controlled, we would have to take them out of the force for a year or two, send them to a school, PCS them, and then bring them back. Well, that was two guaranteed years where nobody would have access to that officer. Now, you might be able to do it at a unit at a cost of months or afternoons. And then, that’s on the unit’s commander to decide.

The other piece that is part of our recommendation is that Army education requirements themselves have not been updated in 20 to 30 years. Less than 3 percent of officer billets in the United States Army require a degree past a bachelor’s, and that is coded into the Army’s requirements.

When the Army has stated in its requirements documents that very few of its positions require advanced education, there is not a priority placed in the budget cycle—or even when these conflicts come up about do I send this officer to go to the 101st and be a S-3, or do I send him to get education? The answer is always S-3 is a requirement. There is no education requirement to be an S-3. Or, there’s no education requirement to be a hypersonics expert or a battalion commander. We will not educate them because there’s not a written requirement to do that.

Part of our recommendation is for the Army to take a hard look at what, by position, is required for education—and probably update it to match more closely the modern labor market. Most positions that officers would fill in the civilian world require education beyond a bachelor’s degree, and 3 to 4 percent of those positions needing advanced education just seems incredibly low.

The last two is incentivize officers to complete self-structured developmental technical certifications that emerge technology. This goes in part with allowing it to be decentralized. The encouragement really should come from the Army has implemented talent management principles with the AIM 2.0 marketplace, where commanders no longer just get assigned an officer, they go and recruit them. And they do this through a robust market where officers are filling out résumés and trying to apply for jobs. And so, what we have found in some of my research with the AIM 2.0 Marketplace is the officers that are most wanted by units are ones that have education that is beyond whatever the Army’s traditional experience is. They bring in these unique perspectives. They have these other certificates, these degrees, these interests that they can show on a résumé and showcase. This attracts them to commanders who are looking for this type of talent in their units.

That AIM 2.0 market cycle had the incentives built into it where officers should be wanting to pursue certificates that allow them then to showcase their interests, their talents, their expertise to commanders, who ultimately end up selecting them for jobs that those officers really want. Part of that incentivization is taking advantage of free opportunities. You know, maybe underwriting some of the costs for some of those, allowing them time off or sabbaticals, which the Army now has to do that. And that just makes them more competitive in the in the labor market. Them being more competitive in the labor market, the internal labor market, to the Army, really is answering demand signals from your commanders. Commanders want this. They just don’t have it in the amount that they’re looking for.

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And then the last one ties into that, which is support the promotion board deferral and sabbatical programs. The DoD, the Secretary of Defense, instituted several years ago the ability for all military to be able to take sabbatical opportunities to pursue anything from starting their own business to pursuing degrees to taking care of loved ones who are aging. That is a program that, across the services, is utilized by the other services at a higher level than the Army does. We have the largest number of people, so we should be outpacing them. And reality is, we don’t make use of it. And I think that’s part of a cultural bias that we have in the Army that we don’t want to get behind our peers. I got to stay on the treadmill to keep up.

That goes part and parcel with the ability of officers now to be able to defer their promotion board. The fact that if an officer wants to pursue education, they can step off the treadmill and go to a promotion board a year or two later—so now they aren’t actually behind their peers in experience. They can go still take a second company command, go be an S-3 of a battalion, and get graduate school. There’s no longer this trade-off on their timeline. They can actually pursue both. And these are things the Army has implemented over the last five to seven years. General McConville spearheaded most of these in his talent management efforts. And I think these begin to allow the Army to not have to suffer the trade-off of do I educate my officers or do I keep them operational is actually, the answer is you can do both. You can educate them and have them be operational—more so than ever before.

**Host**

Do you have an appropriate number of officers who are interested in these programs?

**Wojtaszek**

If you ask a West Point graduate when they are graduating West Point if they intend to pursue additional education past West Point in the future, the answer is “Yes.”

We do not do that survey with ROTC graduates, but we do know through looking at National Student Clearinghouse data that allows us to see officers who are in the Army but then left the Army and ask the question, do they end up going back to school—because we can see them at other universities—we find that in ROTC, a third to a half of them we will see receive a master’s degree within three years of leaving the Army. So, that suggests that they are very interested in education and that, potentially, because they could not pursue it in the Army, they left the Army to go pursue it elsewhere.

You could also make the argument that they left the Army—maybe they couldn’t get a job, and so they went to get more education to get a job. That certainly could be the story. I find that to be unlikely. Usually, our officers can find jobs pretty easily. What they’re doing is to go get education first, so they can land even better jobs and invest in themselves. They’re willing to bet on themselves by investing in themselves.

**Robert**

So, I would just submit that the Army, to remain relevant to the future technologically driven battlefields of the future, must invest now in STEM education of its officer corps.

When the war in Ukraine kicked off, who would have thought we’d go back to a artillery-heavy fight—however, interspersed with non-emerging technologies such as drone/anti-drone technologies, hypersonic flight, hypersonic weapons technology? So, here’s a case where we have this old-fashioned artillery-heavy fight with known technology interspersed on the battlefield. I go back to my statement about graduate education is a strategic

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investment. Just like the Army has strategic partners all over the world because we don't know where the next conflict or fight will be. And we rely on developing those strategic partnerships, it's a way to hedge your bets. Graduate education, as a strategic investment, is a way to hedge the Army's bet on having the right skillsets for future battlefields.

### Host

Leon, Carl, it's been a pleasure. Thank you so much for taking time to speak with me today.

### Wojtaszek

Thank you, Stephanie.

### Host

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