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From the battlefield instincts honed over years of service to the unspoken understanding shared within a cohesive unit, tacit knowledge underpins much of what makes a successful military. The *Journal of Military Learning* (*JML*) recognizes the importance of both codifying and cultivating this often-intangible expertise. This April 2025 edition explores the interplay of experience, narrative, and formal learning, offering valuable insights into how we acquire, share, and leverage the wisdom that shapes military effectiveness. Whether you are a seasoned leader reflecting on your accumulated insights or a newcomer eager to absorb the lessons of those who came before, the articles within these pages offer perspectives to enrich your understanding of military learning.

This issue features a compelling peer-reviewed study on embedding performance psychology practitioners within Army units, emphasizing the importance of leader buy-in for maximizing their impact. Recognizing the transformative potential of artificial intelligence, we also present a practical guide to effective prompting with large language models in professional military education. This timely piece equips readers with the skills to navigate the evolving landscape of AI-driven learning. Furthermore, we revisit key articles on tacit knowledge and the pedagogical power of storytelling for military instructors, offering enduring lessons for enhancing educational effectiveness. We encourage you to begin with the article exploring the nuances of tacit knowledge, allowing its framework to inform your engagement with the subsequent pieces.

As you delve into these articles, consider your own experiences: recall moments where instinct, intuition, or unspoken understanding played a crucial role, and reflect on how a more conscious awareness of your tacit knowledge might have further enhanced your actions and decisions.

Audrey E. Ayers, PhD
Journal of Military Learning
Editor in Chief

Your professional story continues to evolve, and we invite you to share your future contributions with the *JML*.

Moving forward, the *JML* will embrace a continuous publication model, ensuring a consistent stream of cutting-edge research and practical guidance throughout 2025 and beyond. We encourage you to contribute your expertise and insights to this vital conversation. The *JML* serves as a crucial platform for contemporary adult learning discussions, bridging military and civilian perspectives to drive continuous improvement in military education. Through critical analysis and a willingness to challenge existing paradigms, we can collectively unlock new possibilities for enhancing learning within our military community.

A detailed call for papers and the submission guidelines can be found at https://www.armyupress.army.mil/Journals/Journal-of-Military-Learning.

Peer Reviewed

Investigating U.S. Army Unit-Specific Psychological Skills Training Through Soldier and Embedded Performance Expert Perspectives

A Mixed Method Exploratory Evaluation

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Abstract

Soldiers are expected to consistently perform at optimal levels to meet mission objectives and prevent mission failure despite facing adversity related to aspects of their professional and personal lives. To empower soldiers to face these challenges effectively, the U.S. Army Directorate of Prevention, Resilience and Readiness (DPRR) provides access to resources, programs, and training related to increasing readiness and resilience. One such program utilizes performance psychology practitioners, or performance experts (PEs), as a primary prevention resource to train and coach skills and concepts to improve soldier readiness and resilience. These professionals are auxiliary resources outside the unit who provide cognitive and behavioral health expertise, complementing soldiers' tactical and technical training. To improve the PEs' impact, DPRR wanted to embed PEs directly into units. A mixed-methods exploratory evaluation was conducted to understand the perceived benefits and challenges of embedment. Data collected across multiple

sites over two years identified the perceptions of the embedment process using an integrated analysis of qualitative leader interviews, quantitative surveys of soldiers, and qualitative interviews and quantitative survey data from embedded PEs (EPEs). Results suggest that soldiers and leaders perceived EPEs to be value-added experts who contributed to soldiers' resilience and readiness, ultimately impacting unit performance and lethality. Despite the positive perceptions, EPEs experienced critical barriers, including misaligned communications and expectations. By identifying these embedment challenges and successes, the evaluation aims to ensure the program can continue effectively and efficiently improving unit readiness and resilience.

Performance psychology practitioners trained in sport psychology or kinesiology, with a focus on cognitive and behavioral optimization, are successfully utilized to facilitate, support, and evaluate cognitive skills training of civilian individuals or organizations (Lochbaum et al., 2022; Partington & Orlick, 1987). Tactical communities that function within uncertain, challenging, and dynamic environments like the U.S. military utilize performance psychology principles to improve readiness and resilience (Raabe et al., 2021). While the use of psychological training within tactical communities is not novel, leveraging performance psychology practitioners and principles as a preventative approach to enhance readiness and resilience before engaging in high-stakes, operational environments is a strategic, contemporary application (Park et al., 2022).

Currently, the U.S. Army utilizes the Directorate of Prevention, Resilience and Readiness (DPRR), formerly known as the Army Resilience Directorate, to emphasize and highlight resources and programs that promote readiness, resilience, and overall well-being (DPRR, n.d.). More than 200 performance psychology practitioners, or performance experts (PEs), at 32 U.S. Army installations deliver resilience, performance, social, and organizational psychology training to improve the overall readiness (or fitness to execute mission essential or combat related tasks) of soldiers. Soldiers who demonstrate readiness are physically capable of accomplishing their tasks and mentally and emotionally fit to tackle the challenges they may face (U.S. Department of the Army, 2024). PEs offer capabilities that include a variety of individual and group psychological skills delivered in different modalities (i.e., didactic, experiential, in vivo, and during performance). PEs teach, coach, and consult on performance psychology concepts and skills related but not limited to resilience, physical and operation readiness, leader development, and bystander intervention. A critical benefit of the PEs and their training is the application of these concepts and skills to real-world examples. This application is necessary for seeing behavior change related to improved readiness and resilience.

Conceptual Framework

The capabilities PEs offer are grounded in the transtheoretical model (Prochaska & DiClemente, 1982), which explains how awareness and perceptions lead to behavior change. In accordance with this conceptual framework, PEs most effectively deliver their support by recognizing where individuals are on their path to change and how to enhance the environment around them to better support that change. Furthermore, PEs may apply these stages of change to identify soldiers' readiness for change, informing how PEs can tailor interventions to optimize performance, readiness, and resilience. Ideally, the PEs' support of the soldiers' endeavors will result in enduring improvement that can impact performance, readiness, and resilience within individuals and throughout the organization. Considering the transtheoretical model and stages of change enhance the impact of PEs' performance psychology training in this applied setting.

Embedding Performance Experts

Understanding how PEs facilitate enduring performance improvement is critical for the U.S. Army as soldiers train for combat readiness and resilience. Wagstaff et

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al. (2017) described the "structured, time-bound, and competency-based nature" (p. 6) as a natural link between the military training environment and performance psychology training. PEs are valued assets in the military training environment (Knust et al., 2022); however, their impact on unit-specific training and ability to affect behavior change are major hurdles, limited due to perceptions of PEs. Specifically, soldiers and leaders are unaware that PEs provide overall readiness training and offer job-related performance optimization support (Novosel-Lingat et al., 2024). For PEs to be effective, soldiers and leaders must know how to connect with PEs, that PEs are available resources, what the PEs' capabilities are, and how to benefit from the PEs. To overcome these hurdles, the U.S. Army and DPRR decided to embed PEs within combat and combat support units, increasing PEs accessibility to soldiers.

PEs embedding directly into units allows them to use their training and expertise to identify situations that would benefit from improved performance. Ideally, this shift in practice would enhance soldier performance, readiness, and resilience. Embedded PEs (EPEs) have the skills to support soldiers in their day-to-day work environment while tailoring their performance psychology training support with the unit's conditions and priorities. Units with EPEs would have access to these professionals more regularly, and EPEs could offer soldiers in-the-moment training, supporting resilience and readiness.

Mixed-Methods Evaluation

The current evaluation explored the perceived impact of embedding PEs directly into selected combat and combat support units. This shift in the assigned location from the installation level to specific units provided EPEs with more direct opportunities to work with soldiers through unit-specific training and day-to-day interactions. To evaluate the embedment process, the Headquarters Department of the Army's DPRR created a pilot program at four installations. Selected PEs embedded into the combat and combat support units for the pilot program, and nonembedded PEs continued to support all other units across the installation from the Ready and Resilient Performance Centers (DPRR, n.d.). EPEs were directed to provide exclusive regular and ongoing training services to soldiers in collaboration with unit commanders. The aim was for embedment to establish rapport, or mutual trust and connection between EPEs and soldiers, and leader buy-in, or leader willingness to understand and promote the EPEs' training and skills, all to facilitate effective psychological skills training.

Ultimately, DPRR was interested in the perceived effectiveness of embedding PEs within brigades and battalions. To assess the effectiveness, the research team evaluated the perceptions of the program from three perspectives: the EPEs, leaders, and soldiers. The following research questions (RQ) guided this mixed-methods evaluation:

- RQ1: Using a semistructured interview process, what were the EPEs' perceptions of the embedment process?
- RQ2: Using a semistructured interview process, what were the leaders' perceptions of having an EPE in their unit?
- RQ3: Using a quantitative survey, what were the soldiers' perceptions of working with the EPEs?

Methods

Using multiple data sources, a mixed-methods approach (Fetters et al., 2013) was utilized to understand the embedment process. Recommended practices for evaluating programs conducted within the military context (Kaimal et al., 2019; Santo et al., 2021) were followed to structure the reported findings. The Walter Reed Army Institute of Research (WRAIR) collected data for the evaluation as part of a larger program evaluation after receiving approval from the Human Subjects Protection Branch. The WRAIR evaluation team partnered with performance centers across four installations, coded for anonymity as Sites 1 to 4, to observe training sessions and collect data from EPEs, soldiers, and leaders from November 2019 to June 2022. As part of the pilot evaluation, EPEs completed surveys, semiannual reflection essays, and in-depth interviews, soldiers completed surveys, and leaders provided feedback via semistructured interviews. For the current evaluation, the evaluation team employed a mixed-methods exploratory evaluation design to collect qualitative data from EPEs and leaders along with selected quantitative survey responses from soldiers to answer the three RQs.

Sample

Participants for this evaluation were from four large U.S. Army installations in the continental United States. First, the evaluation team collected qualitative data by conducting interviews with 81 active-duty leaders and 27 EPEs, who provided consent. Then, the team collected quantitative survey data from soldiers who worked with EPEs. Of the 463 soldiers invited, 426 (92.0%) provided consent. Survey participants were active duty; half (49.3%) of the participants were junior enlisted soldiers (E1–E4), 25.2% were senior enlisted soldiers (E5–E9), and 25.5% were officers. See Table 1 for complete participant demographics.

Qualitative Instruments

The evaluation team employed a semistructured interview protocol with EPEs to facilitate their reflection throughout the pilot. The first qualitative reflection in-

Table 1
Number of Participants by Site

	Overall	Site 1	Site 2	Site 3	Site 4
EPEs Interviewed	27	6	4	8	9
Leaders Interviewed	81	16	28	16	21
Soldiers Surveyed	426	63	140	147	72
Soldiers' Rank					
E1–E4	205 (49.3%)				
E5–E9	105 (25.2%)				
Officers	106 (25.5%)				

Note. 4 soldier surveys were missing site responses. E1–E4 = Junior enlisted soldiers; E5–E9 = Senior enlisted soldiers

terview occurred six months into the embedment period. Due in large part to the COVID-19 restrictions, these initial six-month interviews took place over Microsoft Teams or Zoom. EPEs were subsequently asked to provide responses to the same prompts as a written reflection at 12 and 18 months into their embedment. The evaluation team requested EPEs (n = 25) to complete additional essays or interviews based on special circumstances (e.g., personnel transitions). The combination of interview and written responses over the embedment period allowed the collection of data that would provide insight on the characteristics necessary for successful embedment into assigned units while also allowing the EPEs to share key information that may not have been discovered through the qualitative protocol. Furthermore, this series of opportunities to respond qualitatively allowed for follow-up questions from the evaluation team.

Leaders were also interviewed using a semistructured interview protocol tailored for their experience, designed to elicit feedback about their perceptions of the pilot program. EPEs helped select the leaders from their embedded units, though they were not present during the actual leader interviews. These interviews took place at least eight months into their EPE's embedment. Similarly, most interviews took place over Microsoft Teams or Zoom, and a few interviews were conducted in person as the COVID-19 restrictions started to lift.

For most of the interviews, conducted both online and in person, at least two research team members were present. One team member led by asking the interviewee questions, and the second team member conducted a live transcription. Additional team members joined the interview when available to ask additional follow-up

or clarifying questions. Following the interview, the transcriber conducted quality control on the transcript and a team member removed identifying information from the transcribed interviews. Participants did not validate qualitative products prior to analysis due to the operational tempo of the military units, however the lead interview conducted an intensive quality control review of transcripts and written products.

Quantitative Instruments

Soldiers trained by the EPEs were administered the 21-item Military Coaching Behavior Scale (MCBS) survey consistent with the psychometric recommendations from Wagstaff and colleagues (2017). The MCBS has five subscales: Observation (four items), Questioning (four items), Goal Setting (five items), Developmental Feedback (four items), and Motivational Feedback (four items). Using a 5-point Likert-type response scale, ranging from 1 (*not at all*) to 5 (*all of the time*), soldiers indicated their perceived satisfaction with the support received from their EPE. Mean scores were calculated for each subscale with higher scores indicating greater satisfaction with the EPE.

Data Analysis

The mixed-methods evaluation required both qualitative and quantitative data analyses.

Qualitative Analysis. Pairs of researchers conducted deductive analysis (Levitt, 2018) of the prompted responses, with the principal investigator available to review any discrepancies or disagreements between the paired coders. Using NVivo software (version R1), one team of pairs analyzed the EPE interviews and reflection essays, while the second pair analyzed the leader interviews. Before the qualitative analysis, both coding teams developed agreed-upon priori codes and refined coding as batches of data were received throughout the pilot. Intercoder reliability was established through discussions, consensus building, and ongoing communication throughout the coding process. When the intercoder reliability coefficient fell below 0.70, the predetermined agreed-upon level of acceptable reliability rating (Landis & Koch, 1977; O'Connor & Joffe, 2020), coders convened to address discrepancies and achieve agreement through discussion. The coders then used grounded theory (Glaser & Strauss, 1967) to determine key themes from the qualitative data inductively. Finally, the coders engaged in a reflexive process (Braun & Clark, 2019) during the coding and thematic analysis to mitigate any bias that may impact the process and impede the development of valid interpretations.

Quantitative Analysis. Descriptive statistics were generated from the soldiers' surveys. Data from the soldiers' surveys were analyzed across the four installations using a one-way analysis of variance (ANOVA). Tukey's post-hoc comparisons as-

sessed specific site differences if a significant main effect was identified. All statistical analyses were conducted on R 4.2.2 statistical computing software by a lead quantitative analyst and reviewed with the evaluation team to ensure a valid interpretation of the data.

Integration

Due to the complexity of the pilot program, an approach to intentionally integrate the qualitative and quantitative data was configured during the design phase of the evaluation. Qualitative and quantitative data were integrated through merged results reporting (Fetters et al., 2013). The evaluation team selected this approach to merge interview and survey data for a more complete and valid interpretation after analysis—not during the data collection—to facilitate a more streamlined process to address each guiding research question.

Results

EPE Perceptions of the Embedment Process (RQ1)

To answer RQ1, the 27 EPEs provided feedback via interviews and written essays about their embedment experience. After coding the input, the team determined recurrent themes, including establishing rapport with soldiers and leaders, the importance of buy-in, the impact on mission-essential tasks, and embedment of misunderstandings.

Establish Rapport. To be effective, EPEs needed to establish rapport with their soldiers and leaders. "I think that's a struggle that some PEs may have, the building rapport and being approachable. I think that's a big win, being the approachable PE so troopers feel comfortable talking with us and learning new stuff."

Being present when and where the soldiers were training for a field exercise was another opportunity for EPEs to establish rapport. Some EPEs went to the field and observed the soldiers' training firsthand. This time provided context for the EPEs and a shared experience for the soldiers and EPEs. "Less talking more action, this unit is busy so instead of constantly meeting, just head out to the motor pool or field and attach and be present working with cadre and observing soldiers train."

Finally, walking around the unit and being seen worked to build relationships between EPEs and their soldiers and leaders. "I realized it's just showing up and being available and just talking to people and hanging out at the staff duty desk, talking to people. That's how you build rapport. Having availability."

The EPEs who built relationships with their soldiers experienced success in terms of being sought out for additional training.

> My greatest success has been the direct requests for trainings. I had to work pretty hard to be established within the battalion once we redistributed after the first of the year, and now I'm continually getting requests. Feeling established, having literally hundreds of soldiers walk by and greet me by name tells me that I'm doing something right, that I've providing [*sic*] value and them [*sic*] I'm providing a positive contribution to the formation.

Importance of Buy-In. The EPEs selected to embed with units established themselves as qualified PEs who could positively impact performance; however, many leaders and soldiers did not understand the EPEs' role or what they were capable of doing. To counteract this lack of understanding, EPEs needed to build buy-in among leaders and soldiers.

> Soldiers love stories and proof. Anytime as an EPE we can provide past success stories or proof such as research suggests, studies show, it buys attention, rapport, and buy-in to listen to the research; especially if the end goal or the why is for us to collect data on improved performance metrics such as qualifications, promotion board, etc.

Having a leader who understood the potential for an EPE to impart change on a unit, a form of meta-coaching, was found to be one of the most effective strategies for increasing buy-in from a unit because of the leader's ability for force multiplication.

> I think that the impact that we had with the master gunner is probably the most impactful because he dictates so much of the training that happens. He's the one training people who are giving feedback. At that level, we're having our best impact. So, the success would be developing that relationship with him as key personnel and him being so on board that he's then helping others and is kind of doing our job for us.

One way to improve buy-in within the unit was to work directly with leaders. One EPE acknowledged the benefit of finding coachable moments with leaders. Capitalizing on a moment to work with key leaders increased the EPEs' chances of having that leader then become an advocate for working with the EPE.

> It helps with your reputation, and I've generated more business from having coachable moments with Company Commanders—they're (EPE) an asset for me (Company Commander)—and they want you to help their Platoon Leaders. Everything you do is always evaluated. It's always game-time when you're around or in the field. Just take it seriously.

Impact on Mission Essential Tasks. When asked directly what, if any, mission-essential tasks EPEs supported, many responded with a range of responses. One EPE stated, "The mission essential task list, like I when I come to work with a unit, I take a picture of that list and make it my to-do list." In support of mission readiness, EPEs either supplemented unit training like time at the range or provided standalone training in conjunction with other support resources on the unit to enhance lethality. "Gunnery is like their big thing and there are all the tasks that falls under that. That is our main focus because it's their main focus."

> I've been integrated with the rifle range, gunnery ranges, Strykers, platoon and squad live first events, I did some stuff with the medics who were recertifying, team leader academy, platoon leader academy, observed company and platoon training events that were in the field for several days. One day I stayed overnight, buy typically, I would be there really early to really late. I would find teachable moments. I've done some work with individual soldiers before they go to schools—snipers, ALC [Advanced Leader Course], master gunnery school. That is academically rigorous.

> The projects that I am currently working on are the BDE [Brigade] Foundational Readiness Training which is for the TOP 15 members at BDE. This is a monthly training. Additionally, I created the BDE counseling course POI [Program of Instruction] which does include R2 [Ready and Resilient], legal, CDRs/1SGs [Commanders/1st Sergeants] (experienced soldiers), MFLC [Military Family Life Counselor], CH [Chaplain], BH [Behavioral Health] and other entities. This is a holistic approach.

Often the EPEs' work supplements unit training, which aims to improve qualification success rates or physical fitness. More soldiers qualified and physically prepared indicates that there are more soldiers ready to tackle the unit's mission. "I helped get all the crews certified at gunnery, everyone has made tape and morale has increased." From another EPE, "We participated in a lot of airborne operations because it is essential and that's what they need."

Finally, EPEs can tailor their training to focus directly on enhancing the unit's lethality.

> Yeah, so part of the lethality enhancement training is the sims [simulators]. Part of it includes the mental skills we teach for them to use in the simulation. And running them through trainings, helping them run through the sims better. It helps them be better able to pass the gunnery tables and training licensing and being able to drive the tanks and stuff. They have to go through them so many times. The lethality enhancement training is for mission essential tasks. I've

> been out to ACFTs doing hip pocket training & coaching while they're going through the mock ACFT. I haven't been to the range or the gunnery tables.

Embedment Misunderstandings. While many EPEs shared positive feedback and best practices, many shared struggles regarding embedment misunderstandings. Many EPEs felt underutilized and attributed that to a lack of understanding of their role.

> We understood that they have no idea who we are and what we do. Maybe one person in the battalion understood, but that's it. One person out of 1100-1200 people—that's just a lot of ground to cover. It's just attending and observing, attending, and observing continually, the more I was there.

Leader Utilization and Perceptions of the Embedded Performance Experts (RQ2)

To answer RQ2, 81 leaders agreed to discuss their experiences working with EPEs within their units. The leaders' feedback informed themes related to successful embedment in terms of recognizing the value of EPEs in units, appreciating proactive and knowledgeable EPEs, highlighting when EPEs built rapport within the unit, and emphasizing the EPEs' participation in unit training. Leader feedback also acknowledged challenges with embedment related to EPEs' role confusion.

Leaders Recognized the Value of Having an EPE in the Unit. Leaders understand that they have many resources, but some recognize the specific benefit of having PEs embedded directly in their unit. This recognition made the resource more available and the EPE more approachable for soldiers. "If there's a problem in your unit, why would you NOT use them?"

Once leaders started to see the expertise and training of the EPEs in mental skills and performance outcomes within their unit, many leaders understood the potential impact of EPEs as valuable resources. "[H]is impact has been monumental, huge impact on the battalion, challenges of preventing suicide, depression, and high-risk behaviors. I can't handle all the things on my own. Integral to our success as a battalion."

Leaders Appreciated Proactive and Knowledgeable EPEs. Oftentimes, leaders struggle with having multiple responsibilities and tasks within a day. Having an EPE who understood the unit mission and had the skillset to coach soldiers on performing their duties was a critical resource for leaders. It was even better when those EPEs were confident and knew when to step in and assist soldiers. "He wasn't waiting for us to tell him when he could come out. He was actively seeking opportunities."

Leaders also recognized the value of having outside resources like EPEs who understood how to make training relatable to their soldiers.

> Too often we see the Army examples that are exaggerated. That was fake and not relatable. Everything she presented was relatable and raw and that's what people connect with. And she'd be talking about something and get emotional and that I that, I think we need to see that it's not some black and white, cookie cutter kind of thing. Her knowledge level on everything is insane.

Leaders Recognized When the EPE Built Rapport with the Unit. Leaders must simultaneously take ownership of their unit's morale and welfare and the successful execution of their unit's mission. While being the primary face of unit morale may not be their role, leaders should ensure that key personnel and resources are readily available for their soldiers. Many leaders acknowledged that their EPEs were crucial in fulfilling that responsibility. "Morale booster, hands-down. Their faces light up when they see her, that's hard, the relationship she built, the presence, they just love her."

Leaders Appreciate When EPEs Participate in Unit Training. Leaders appreciated the EPEs' willingness to participate in unit training. By doing so, EPEs made themselves more available to the soldiers and continued to build relationships within the unit.

> He's gone to the field, training, counseling certification in the classroom, he's always there. We've been talking about "threat vs challenge." A lot of my soldiers originally approached training as a threat but now see it as a challenge because of the things [EPE] has taught them.

Leaders Acknowledged the Initial EPE Role Confusion. Leaders admitted that they were initially confused about the role of the EPE. This confusion led to missteps or miscommunication between the EPEs and the leaders. Without a proper understanding of the EPEs' role within the unit, leaders struggled to understand how to utilize that resource. "First, I thought they were like cheesy life coaches, now I understand what their objectives were. I wish I had known earlier so we could have used them earlier to get the best performance out of people."

Soldier Perceptions of Embedded Performance Experts (RQ3)

The MCBS survey given to soldiers in the embedded units assisted the researchers in answering RQ3. Mean scores were computed for each of the subscales: Observation, Effective Questioning, Goal Setting, Developmental Feedback, and Motivational Feedback. The subscale means ranged from 3.86 to 4.09, indicating soldiers perceived their EPEs positively. There were no significant site differences for the Effective Questioning subscale ($F[3,305] = 1.954$, $p = .121$) though there were for the Observation, Goal Setting, Developmental Feedback, and Motivational Feedback

Table 2

Military Coaching Behavior Scale (MCBS) Subscale Means Across All Soldiers and by Site

MCBS Subscale	Overall		Site 1		Site 2		Site 3		Site 4				
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*df*	*p*
Observation	3.86	1.00	4.21	0.98	3.63[a]	0.94	3.94	0.95	3.62[c]	1.07	5.103	3,305	.002
Effective Questioning	4.09	0.92	4.31	1.00	3.99	0.87	4.11	0.86	3.94	0.98	1.954	3,305	.121
Goal Setting	3.92	1.04	4.39	0.88	3.70[a]	1.09	3.97[b]	0.97	3.62[c]	1.13	6.923	3,300	< .001
Developmental Feedback	4.06	0.95	4.42	0.87	3.94[a]	0.92	4.07	0.88	3.84[c]	1.13	4.220	3,304	.006
Moticational Feedback	3.89	1.04	4.31	0.96	3.78[a]	1.00	3.90	1.02	3.61[c]	1.12	4.963	3,302	.002

Note. Due to missing data, the sample sizes used for the subscale analyses ranged from 306 to 313. Significant main effects were identified after conducting Tukey's Honest Significant Difference post-hoc comparisons.

[a] Site 2 was significantly different from Site 1.

[b] Site 3 was significantly different from Site 1.

[c] Site 4 was significantly different from Site 1.

subscales (F[3,305] = 5.103, p = .002; F[3,300] = 6.923, p < .001; F[3,304] = 4.220, p = .006; F[3,302] = 4.963, p = .002, respectively). For the Observation subscale, Site 1 (M = 4.21, SD = 0.98) was rated significantly higher than Site 2 (M = 3.63, SD = 0.94; p = .006, 95% CI = -1.02, -0.13), and Site 4 (M = 3.62, SD = 1.07; p = .008, 95% CI = -1.06, -0.12). For the Goal Setting subscale, Site 1 (M = 4.39, SD = 0.88) was rated significantly higher than Site 2 (M = 3.70, SD = 1.09; p = .001, 95% CI = -1.16, -0.22), Site 3 (M = 3.97, SD = 0.97; p = .049, 95% CI = -0.84, -0.001), and Site 4 (M = 0.62, SD = 1.13; p < .001, 95% CI = -1.26, -0.28). For the Developmental Feedback subscale, Site 1 (M = 4.42, SD = 0.87) was rated significantly higher than Site 2 (M = 3.94, SD = 0.92; p = .024, 95% CI = -0.91, -0.04) and Site 4 (M = 3.84, SD = 1.13; p = .006, 95% CI = -1.03, -0.13). Finally, for the Motivation Feedback subscale, Site 1 (M = 4.31, SD = 0.96) was again rated significantly higher than Site 2 (M = 3.78, SD = 1.00; p = .020, 95% CI = -1.00, -0.06) and Site 4 (M = 3.61, SD = 1.12; p = .001, 95% CI = -1.20, -0.21). The remaining subscale comparison were not significantly different. See Table 2 for the means of each subscale.

Discussion

The mixed-methods evaluation sought to assess the embedment of PEs into selected units across the U.S. Army. Overall, findings from the data suggest that soldiers and leaders perceived EPEs as positive enablers to soldier performance training

and valued leadership team members. EPEs enhanced the operational mission and translated soldier, leader, and mission needs into specific performance skills training, which leaders identified as a critical benefit and resource. EPEs contributed to greater individual soldier readiness and resilience through their efforts to positively impact mission essential tasks and improve morale. Additionally, key leaders perceived their EPEs as effective assets. Furthermore, EPEs enjoyed the opportunity to be a resource within units. They identified ways to increase their effectiveness by ensuring leaders understood their capabilities and leveraging those leaders for strategic, mission-oriented support.

Qualitative data from both EPEs and leaders supported several themes regarding the experience and professional practice of EPEs. First, responses indicated that the EPEs enhanced the units' perceived quality of training and soldiers' personal readiness. Next, leaders and EPEs identified characteristics, such as building rapport with soldiers and being present within the unit, that benefitted the EPEs and strengthened their ability to connect to the unit. By leveraging mission essential tasks lists, EPEs more easily established rapport and buy-in. Soldiers and leaders recognized the importance of their EPEs understanding their job-specific tasks and valued that time and effort. This understanding helped EPEs tailor the performance psychology training to the tactical and technical aspects of their soldiers' mission. As a mission-focused context, the evaluation team developed themes related to service delivery and the type of support EPEs could provide for military tasks and unit initiatives. A final theme highlighted the misunderstanding of the role and the incorrect association of the work of an EPE with more familiar assets (e.g., suicide prevention or behavioral health).

More specifically, the EPEs' feedback during interviews and written essays centered around the unique experience of embedment. Their responses predominately focused on individual characteristics that led to their success in this alternative utilization and common hurdles that challenged the program. Responses from leaders who worked with EPEs in their unit focused mainly on the impact of the EPE on the unit, the characteristics of a successful EPE, and methods used by EPEs to support the soldiers. The predominant theme from the leaders centered around valuing EPEs as a unit-level resource, even considering them as part of the battalion's special staff (e.g., chaplain, behavior health officer). Related, leaders also discussed other unit resources or assets that could serve as collaborators for the EPEs to enhance the impact of the resources, additional ways to utilize EPEs to support training, and improvements to both the EPE program and role within the unit.

Finally, soldiers perceived their EPEs as beneficial and effective for them and their unit, as indicated by high mean subscale scores across all four sites. Though soldier perceptions at Site 1 were significantly higher than the remaining sites, soldiers across sites rated their EPEs favorably. As leaders noted in their interviews, their soldiers "love" working with their EPEs, and leaders observed the morale of their unit change in a positive way after the unit started working with the EPEs. This estab-

lished relationship enhanced soldier performance and readiness, which ultimately improved the unit's lethality.

From an integrated analysis of the data collected through mixed methods, EPEs appeared to positively impact their units despite experiencing some challenges. Oftentimes, these challenges appeared rooted in leader buy-in or lack thereof. In other words, when the EPEs had the opportunity to work with the soldiers, their impact was noticed, and their contributions were appreciated. Leader buy-in appeared to be a key factor associated with the EPEs' consistent opportunities to work with soldiers as the leaders have some control over the unit calendar. EPEs with leaders who understood their capabilities and who could protect time on the unit calendar for the EPEs to conduct their training appeared to have more soldier engagement. Even with last-minute schedule changes due to the requirements of the unit's mission, supportive leaders still found time to reschedule their soldiers' engagements with the EPEs.

More impactful than protected schedules came when leaders publicly endorsed the EPEs' work with soldiers or discussed their experiences with the EPEs. These leaders led by example and brought awareness of the EPEs and the EPEs' potential impact on performance, readiness, and resilience to their soldiers. Alternatively, when EPEs had challenges with leader buy-in, EPEs tended to struggle to find soldiers willing to work with them. Soldiers who worked with EPEs rated their EPEs positively and felt the interaction was valuable, therefore, developing and maintaining leader buy-in could stand to increase the number of soldiers able to work with EPEs. Moreover, if soldiers see their leaders attend EPE training, personally use the skills learned, and reinforce the principles with the unit, the leaders become a force multiplier for implementing the skills.

Limitations

This mixed-methods evaluation was not without its limitations. First, the COVID-19 lockdown impacted the EPEs' ability to work directly with soldiers. The four sites with EPEs started their embedment process at different times. One site had its EPEs in place and they were already working with soldiers for approximately three months prior to the lockdown. Another site locked down two weeks after their EPEs embedded. All sites felt the lockdown's impact as it hindered the EPEs' ability to connect with leaders and soldiers in conventional in-person observations and interactions. Ultimately, the constrained interactions impacted the EPEs' ability to establish relationships with their soldiers and leaders. The COVID-19 restrictions also impacted the evaluation as the team had reduced in-person interactions with EPEs, leaders, and soldiers; had limited opportunities to observe EPE training with soldiers; and had to conduct most qualitative interviews virtually.

In addition to the COVID-19 lockdown restrictions, one site had a unit tasked with a deployment that started while their EPE was embedded in the unit. The EPE

had limited opportunities to work with those soldiers during deployment training and did not deploy with the unit. Next, EPEs were initially told the pilot program would evaluate one year of embedment; however, due to the limitations related to the COVID-19 restrictions already mentioned, DPRR extended the evaluation. EPEs remained in place, and the evaluation team continued their evaluation for an additional year. While this extension provided more opportunities for the evaluation team to observe the EPEs, the extension also led to turnover among the EPEs, as some left their positions and others were reassigned to additional or different units.

The evaluation team's ability to assess the pilot program from a strict and narrow evaluation framework was also limited. First, the evaluation team did not standardize a performance outcome for all units. This decision allowed the leaders to share their priorities for their unit with their EPEs and then let the EPEs tailor the necessary training to address those priorities. While this flexibility allowed leaders and EPEs to assess the best outcome for their unit, it limited comparisons across sites. The evaluation team also did not conduct any pre-embedment assessments of the units (i.e., unit climate and morale, or physical training performance) before the PEs embedded nor did the evaluation team assess units without EPEs. These decisions limited the evaluation team's ability to quantify the EPEs' impact on their units. Future evaluations should consider preembedment assessments and have comparison units. Finally, the EPEs provided the names of unit leaders for the research team to interview during the evaluation. This decision could have led to potentially biased interviews as the EPEs often selected leaders with greater buy-in to the program. Future evaluations may consider using a random sampling of leaders to prevent selection bias when choosing interviewees.

Future Directions

As a mixed-methods pilot evaluation, the goal was to assess the perceptions of the effectiveness of EPEs to better understand how units received and benefited from the EPEs' expertise to ultimately inform future embedding professionals. While the evaluation team observed and reported several successes with the program, they also observed potential ways to improve the program's perception. To aid leader buy-in and implementation of the training, EPEs should consider using a multifaceted approach in their training. EPEs are uniquely situated to have multiple touchpoints in a variety of settings with their soldiers. For example, EPEs are not limited to classroom instruction and can instead walk around the soldiers' areas of operation. This access allows the EPEs to observe the soldiers' job-specific task and provide on the spot, tailored training along with continual feedback or guidance along the way as needed.

While we found the perception of the EPEs to be primarily positive, EPEs remain a limited training resource. To improve the reach and impact of EPEs, DPRR should promote a multifaceted approach to highlight them as a training and teaching asset. This approach includes allowing EPEs to teach skills in a classroom, coach to

reinforce skill application in the field, and meta-coach leaders to be force multipliers and amplify the EPEs' impact. Coaching and meta-coaching soldiers and leaders empower them to take on more of the direct instruction typically done by EPEs, thereby reaching more soldiers within the unit. This shift also allows EPEs more time to observe soldiers and leaders coaching and offer feedback to enhance those skills.

As embedment continues, further evaluations should assess objective performance outcomes to quantify the EPEs' impact on their units, explore how to effectively use EPEs, and measure how the multifaceted approach implemented in this pilot program could potentially improve a unit's performance, readiness, and resilience. Additionally, future research is needed to better understand how unit factors (e.g., mission set, location, and components), leader qualities, and EPE characteristics impact the effectiveness of embedment.

While not all PEs can embed due to other installation training requirements, it is valuable for the Army and DPRR to consider how to integrate all PEs with the Integrated Primary Prevention Workforce (IPPW), an effort that the Department of Defense recently initiated (Office of the Under Secretary of Defense, 2022). The IPPW is working to decrease risk factors and increase protective factors by using data to inform unit-integrated primary prevention plans. PEs are valuable supplemental assets to engage with leaders and soldiers related to primary prevention.

Conclusion

While the mixed-methods evaluation had limitations, the findings provide compelling evidence that supports the continued embedment of PEs within units to enhance readiness and resilience. After assessing two years of PE embedment within U.S. Army units, perceptions of the program were positive. Soldiers and leaders found the EPEs' ability to coach their soldiers through the understanding and application of various psychological skills to impart lasting change to be beneficial. Ultimately, soldiers, leaders, and EPEs appreciated the opportunity and saw benefits in the program. These results are promising given that the EPE program is not the only resource within the U.S. Army or U.S. military at large that utilizes embedded professionals. In fact, sharing the perceptions of embedded professionals and of those working with embedded professionals may benefit fellow embedded assets. Future research could work to better understand best practices to embody and implement to mitigate embedment challenges and enhance embedment impact.

Disclaimer

Material has been reviewed by the Walter Reed Army Institute of Research. There is no objection to its presentation and/or publication. The opinions or assertions contained herein are the personal views of the authors and are not to be construed as

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Data Availability Statement

The data and material for this evaluation are not publicly available due to institutional regulations related to human participant protection requirements. However, they can be made available from the corresponding author upon reasonable request (may require data use agreements to be developed).

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Enhancing Professional Military Education with AI

Best Practices for Effective Implementation

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Abstract

The increasing prevalence of artificial intelligence (AI) tools has significant implications for professional military education (PME). As AI technologies continue to evolve, they offer new opportunities to enhance learning outcomes, improve educational efficiency, and support the development of critical skills for military professionals. However, integrating AI tools in PME also raises important questions about their effective use, ethical considerations, and potential pitfalls. This article provides an overview of the current state of AI tools in PME, discusses the benefits and challenges associated with their use, and offers best practices for military educators to optimize their implementation. By examining the potential applications and limitations of AI tools, this article will inform the development of effective strategies for leveraging AI in PME, ultimately enhancing the learning experience and preparing military professionals for the complexities of the modern operational environment.

Clear communication is a critical skill enhanced during professional military education (PME). As with any critical skill involving a constant pursuit of improvement, many different tools and techniques exist to foster better development of professional communication. Artificial intelligence (AI) is one such option that has garnered significant attention for its potential and its boundless innovation. These AI products have become nearly unavoidable and touch every facet of daily life. For example, educators can now use AI-powered platforms to streamline different administrative functions to include grading essays (Chen et al., 2020), and healthcare professionals are seeking new ways to utilize AI for clinical decision-making (Secinaro et al., 2021). Big tech companies like Google and Microsoft have further invested billions of dollars to integrate AI tools into their existing product lines

(Rattner, 2024). With so much investment into AI products, their seeming omnipresence will likely become a permanent reality.

PME could likewise benefit from further integration of AI into the curriculum. Impending changes are evident as accredited and degree-granting programs within the PME space have altered policies to permit the use of AI for coursework (U.S. Army Command and General Staff College, 2024). In practice, students could benefit from these AI tools in many ways. Someone might upload a draft essay and ask for feedback on their current version, along with recommendations for improvement. Artwork could be generated to support classroom war-gaming or key presentations. Students might also brainstorm writing ideas or generate summaries of articles through AI. Whatever the specific problem set, there is likely some application where a student could integrate an AI tool into their military studies.

Despite lifting prohibitions against AI for PME, there remains a great deal of exploration that must occur. For example, even if personnel can use AI, what are the optimal applications? How do service members implement AI to enhance their professional communication without violating ethical standards? What military-specific challenges might arise in a military context that would not apply as readily to other areas of education? After all, military jargon alone might provide a hurdle to a large language model (LLM) if the base text builds upon civilian dialogue—and this concern exists alongside the obvious security issues of entering military orders, data, and documents into sometimes publicly available AI products that learn from the information entered. There are many concerns as to how students should use AI products in PME, yet there is also ample opportunity to begin developing best practices to support effective and ethical AI use during coursework. Higher echelons have already issued some guidance regarding military applications for AI products (U.S. Training and Doctrine Command, 2024).

Although AI tools could greatly enhance PME, effective implementation requires understanding both their capabilities and limitations. The current discussion will identify some best practices and ethical pitfalls when integrating AI into professional military studies. As such, the key goal is to enhance communication among future military leaders while educating them on the challenges of AI tools. The discussion will begin by describing the development of AI programs and LLMs that have received recent popularization as new commercial products. The first objective is to establish a base understanding for individuals about how AI products are developed

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and their general capabilities. Next, the focus will shift to ethical pitfalls and key problems that exist when utilizing AI tools. Finally, the discussion will review best practices on how AI can be used to support PME. The goal for reading should be to supplement comprehension when dealing with larger-than-normal reading volume, and the goal for writing should be to enhance professional communication while appropriately crediting sources and AI material without violating academic policies. Ultimately, the collective discussion aims to enhance PME by building upon recent changes in policy that allow AI products to enhance the educational experience.

Artificial Intelligence: What Is "AI" and How Can It Be Used for Military Applications?

In recent years, AI evolved from an abstract topic of cognitive science (cf. Fetzer, 1990) to a dominant force among commercial, educational, and industrial sectors. A multitude of products now incorporate AI or claim AI development to tout their enhanced potential. Businesses have integrated AI into their product lines to deliver better solutions for customers, and noncommercial entities have likewise sought to utilize this technological enhancement in their respective spheres of influence. For example, people have explored AI integration for diverse applications such as natural disaster responses (Sun et al., 2020) and medicine (Meskó & Görög, 2020). Still, despite the seeming omnipresence of AI solutions in daily life, this technology remains under continuous development with many people retaining only a cursory understanding of it. Therefore, the first question must remain the obvious one: What is AI?

Many people use the term "AI" as a catchall for metaphors, mental models, and word prediction paradigms without a common definition for what does or does not qualify as AI (Heaven, 2024). Contrary to popular usage, most current AI models exploit LLMs rather than true AI. An LLM processes enormous volumes of data to learn patterns and adjust feedback to approximate a human response (Zhou et al., 2024). Essentially, an LLM predicts what humans would say by examining large volumes of text to identify predictable patterns. There is no true intelligence to the response, merely a probable combination of outputs. That said, the models can become increasingly more reliable with larger and larger input, which previously limited their dependability as a function of computer processing power through both initial training and data available to process.

Technological advances have solved a substantial portion of the problem as smaller and smaller computers have larger and larger computing power. In this way, LLMs have become capable of processing enough predictable relationships to approximate realistic human responses, hence the oft-mislabeled distinction as AI when the real description should be LLMs. True AI is instead known as artificial general intelligence (AGI; McLean et al., 2023). The key distinction is the capacity to transfer

learned knowledge and processes to new domains rather than being restricted only to the learned domain. Although AGI remains a theoretical concept, for the time being, this capability could adapt to new environments without the explicit programming to support novel applications.

Despite remaining limited to machine learning and LLMs, many systems called AI have developed remarkable capabilities when responding to user inputs. Search engines now regularly include AI overviews as summaries for certain queries. Likewise, reading platforms frequently come accompanied by AI tools to aid in summarizing or processing the main text. These tools have also reached a point of maturity where the outputs cannot be ignored as simplistic or trivial. Modern AI platforms continue to refine output with increasingly more meaningful capabilities. In turn, there is potential to utilize these tools for support in higher education, and a growing number of advocates argue for permitting AI tools in PME (Kelly & Smith, 2024).

When applied to the military context, there are a few important considerations to note that make AI usage for PME or military-specific AI tools different from other forms of technology. Foremost, an LLM predicts text based upon relationships learned from a preliminary training stage. ChatGPT, a large natural language processing algorithm, incorporated 570 gigabytes of data in its training phase (Heikkilä, 2023). Even a conservative evaluation would suggest this volume of data includes hundreds of thousands or millions of texts and billions of words. Nevertheless, the learning dataset is also a restriction unto itself. AI models depend upon the text used during their training phase to make predictions about the next word or when evaluating content. For military applications, the training set becomes a double-edged sword. Any generalized training data might not be capable of addressing military parlance or problems, and there would be massive operational security violations to train a widely available resource with military data. Specifically, if a publicly available LLM were supplemented with military data for further training, anyone with access could ask questions that reveal information from data reviewed during the training phase. Adversaries could peruse controlled military documents at will through this vulnerability.

Instead, the solution is to develop controlled military datasets for training military-specific AI tools. These instruments can be constrained to specific information that best exemplifies the military context by uploading only military sources. Such tools would need to be restricted and limited to the unclassified or classified systems on which they learned. Even so, this limitation is no more restrictive than any other constraint accompanying classification for operational purposes. More importantly, the Department of Defense has already begun building and deploying AI tools for military purposes, and the reception has been voracious. The U.S. Air Force and Space Force released an AI tool for internal use dubbed NIPRGPT (the Non-Classified Internet Protocol Generative Pretraining Transformer) in 2024; three months after its release, over 80,000 airmen and guardians experimented with the system

(Albon, 2024). Perhaps the most important lesson from this context is the inevitability of AI tools. Service members will encounter them in daily life, and they will be eager to employ these tools in their professional duties.

Ethics and Challenges in Using AI Tools

The most straightforward ethical issue comes from a simple assumption—namely, that the output of AI tools is precisely what it purports to be. Too many people presume that the answer to a prompt is factual. However, AI can "hallucinate," which describes how AI might generate highly skewed, misleading, or outright false content (Lakhani, n.d.). There is no singular reason why hallucinations occur. Some instances might be due to biased training data, outdated information, or a model attempting to overfit a response based on what it has learned. The latter example can produce even purely fictitious claims if the model training involved recognizing and processing certain formats. Still, an important thing to consider is that AI tools are designed to provide a response. Whereas a student might admit not knowing an answer, the AI tool will provide something whether that response represents accurate information or not. Viewed in this light, hallucinations are a byproduct of an algorithm programmed to provide a response whenever prompted. The inherent danger is assuming the output to be factual.

Among the various instances of hallucinations catching people off-guard, there is an example of how damaging the assumption of accuracy can be. In a 2023 New York aviation lawsuit, attorneys utilized ChatGPT to help them prepare a federal court filing, which they presented to the court as the AI tool had delivered (Bohannon, 2023). Unfortunately, the program hallucinated and produced not one, but six fictitious cases to show precedence for their claims in court. When discovered, the judge eventually sanctioned the attorneys for dereliction of their responsibilities by presuming the cases were real and not investigating the cited precedence themselves (Merken, 2023). Moreover, they are no longer alone in this embarrassment. Other cases have occurred where lawyers have allegedly used AI tools to prepare cases without properly investigating the outcome, only for the AI to hallucinate and cite more nonexistent cases (Cecco, 2024). These examples represent actual cases where individuals who accepted information without verifying the record faced severe real-world consequences.

Another challenge involves AI translations between languages. Neural machine translation, among other techniques, has greatly enhanced the accuracy of translations through supporting software (Mohamed et al., 2024). AI tools have been remarkable in advancing this capability. However, the translations are not perfect and misunderstandings can cause severe consequences. For example, people have been denied asylum in some cases because translation errors misrepresented their case to

immigration authorities (Bhuiyan, 2023). This instance would appear to be an ideal use case, where limited border authorities could utilize technology to cover shortages in manpower while still addressing the many language-related issues that could arise in border crossings. Instead, the example demonstrates how subtle differences in meaning that an interpreter might catch could be overlooked by AI software. Nuance becomes one of several possible underlying explanations for the discrepancy. Specifically, language-learning systems apply better to high-resource languages with many examples for input, like English or Chinese, but might encounter significant problems converting from English to other languages (Gordon, 2024). AI tools are becoming more robust each day, yet they currently lack the capability to parse nuance the way a human might.

The learning set itself could be a problem that leads to ethical misunderstandings. In an academic environment, plagiarism is a common concern wherein one student takes credit for someone else's work. Previously, plagiarism would become an issue when students copied from someone else or failed to cite appropriately throughout their writing, but AI tools introduced a new wrinkle to this problem. Because AI tools often learn from prompts and material with which they interact, the same algorithms could learn from related work and provide answers that seem original without being so. Students may believe the work to be an original AI generation, and therefore they would not be plagiarizing an individual. Nonetheless, AI may be regurgitating related work from which it learned that too closely approximates text from another student. This possibility is a problem for any black-box-style learning system, which describes a system or process where the inner workings lack transparency. Black box learning instead relies upon input-output relationships, whereas internal learning procedures cannot be fully documented or generated. Simply put, no one may fully understand why an AI product generated a given response because they cannot fully replicate the logic developed during its training.

Even if proper citation could address the plagiarism problem, citing AI usage differs from a typical citation. Other media or scholarly sources have some method to identify the author or organization when citing the originating idea; yet AI tools generate the information without an independent author to cite. This issue too has led some students to believe that work generated with AI does not require citations. To avoid the issue entirely, many universities have adopted new methods for properly citing and crediting AI tools when used to develop research or other written products (Brown University Library, 2025). The intent is merely to ensure that instructors can appropriately gauge critical thinking in writing, or in the case of research efforts, the authors provide a reproducible pathway to identify sources.

Some PME programs have likewise instituted policies in accordance with these ideas that permit the assistance of AI tools in writing (e.g., U.S. Army Command and General Staff College, 2024). That said, students must continue to submit original work for educational assessments, which is why there must be some understand-

ing as to what the student generated without help and what elements could be attributed to AI assistance. Student guidance currently identifies that AI tools could be helpful in analyzing writing prompts, assembling outlines for class writing assignments, summarizing source material, and offering suggestions in editing (Lythgoe et al., 2024). Any one of these options represent powerful tools to help writers produce higher-quality material, especially if they have not produced scholarly work in some time. The caveat is merely to ensure that students cite all AI-generated content through footnotes that document prompts or other edits as contributed by AI tools (Lythgoe et al., 2024).

Furthermore, footnote entries offer an interesting middle ground to the challenge of original work assisted by AI for multiple reasons. Foremost, there is a process to identify how a student utilized AI, which is important since there is technically no original source to cite. This documentation limits the extent of confusion that might result if academic integrity checks flag material as unoriginal or plagiarized content. Additionally, footnotes are not intended to be lengthy accounts within a manuscript the way endnotes or appendices might be. A footnote provides an opportunity for documentation while inherently limiting the space available. As a general rule, if capturing AI support becomes cumbersome enough to warrant a full appendix, the individual is probably relying too much upon AI for content generation.

Thus far, these ethical issues have largely resulted from accepting AI output at face value or falsely claiming content generated through AI as original work. Other issues that arise within a research context concern the unintentional infringement of individual rights. Specifically, research ethics provides many different tools to protect the rights of research participants. These rules include ethical oversight and informed consent if the research involves human subjects. When involving AI tools, there is the potential for private information to be released or for available information to become identifying when presented in aggregate, thereby raising privacy concerns when using generative AI (University of North Carolina, n.d.). For example, someone might enter research data into a publicly available AI tool that learns from updated information. The details might be de-identified when contained, but the uploader cannot know everything else processed through the platform. If the system encounters related information, there is a possibility of integrating old data and new data into a learning model that produces spillage. In essence, entering data (including datasets, unpublished work, or other proposals) into public places is tantamount to public release, and the uploader cannot predict how the AI tool will process or distribute this information. This unknown creates a potential vulnerability for individual privacy. Universities, publishers, and funding organizations are trying to catch up with the emerging AI tools for research applications, and in the short-term, there are significant ethical considerations for AI in research around which these organizations are still developing norms, requirements, and best practices.

Another area of concern becomes apparent in the blended use of AI with two different users applying AI for complementary functions. Basically, if one user generates content with AI, and another user processes that content with AI, there is the potential for a portion of their interaction to become dominated by AI processing rather than human interaction. One user could knowingly attempt to gain an advantage through manipulating content if they know the user on the other end will utilize AI to process their content. A prime example of this possibility is a human resource manager using AI tools to help sift through many résumés for a particular job opening. There are tricks people have employed to gain an advantage in this context, such as blending white font into the document (Abril, 2023). Human readers would not see the white text without further inspection, yet AI would process it the same as any other text. Someone could use the opportunity to insert numerous keywords aligned with the job opening to raise interest in their application. Alternatively, someone could enter commands for the AI to secure a desired outcome. In the case of AI-assisted interviewing, the applicant could instruct the AI tool to tell hiring managers that they are the ideal fit for a job. Whether these actions are truly unethical or a novel business practice to garner attention, in an academic environment, the concern is students using AI to circumvent their instructors. This situation could arise if instructors are using AI tools to assist in their evaluations of student work. As such, the example is an important demonstration that instructors should be careful when using AI to avoid unintended consequences.

Tips and Tricks to Effectively—and Ethically—Use AI Tools in Professional Military Education

LLMs and AI have the potential to enhance education in numerous ways, including through the production of novel educational content, to enhance student engagement, and to personalize learning experiences (Kasneci et al., 2023). Understanding ethical challenges helps lay the groundwork for effective usage of AI tools in PME, though this information does little by itself to optimize AI use. Instead, there are several tips and tricks developed by ambitious people over the past few years that could help students maximize their possible benefits from these technological instruments. There is an inherent focus on AI support of writing in the following advice. Nevertheless, there is overlap in applying these tips for AI as a study tool as well (see Table 1 for an overview).

Before considering more advanced use of AI tools, the first tip applies to beginners. Summaries and background information are two things AI normally processes well since the task merely involves presenting facts. However, AI tools—at present—cannot produce human-level understanding and synthesis of information. Thus, the first beginner mistake is to ask simple questions of AI tools and develop only a

Table 1
AI Challenges and Best Practices

Key Problem or Ethical Challenge	Best Practice to Implement
AI can hallucinate and provide false or misleading answers.	Ask AI to provide sources for its information. Independently verify sources rather than take AI output at face value.
Accusations of plagiarism if AI provides answers similar to previous data.	Document prompts and interaction with AI programs to maximize replication potential and minimize false claims of plagiarized work.
Students rely solely upon AI rather than reading the required texts.	Use AI to supplement reading rather than as a replacement. Complete a read through first to provide a base understanding before asking AI questions.
Translations and nuance not always captured by AI software.	Ask multiple iterations of the same question to capture nuance in meaning. Use different perspectives when framing questions to capture the problem set from different angles.
Entering military data or military-relevant prompts into a large language model with public access.	Treat commercially available AI tools as belonging to the public domain. Avoid creating operational security vulnerabilities by entering controlled information into public domain. Use constrained notes, restricted datasets, and military-specific AI tools when conducting official military functions.
Data entry should be considered public release of information and could jeopardize privacy.	Assume AI will aggregate data and potentially violate individual privacy for personal information. Consult the Human Research Protections Office for further guidance to avoid confusion.
People can manipulate materials if they believe AI will be used to process the information.	Ask how someone might use AI to process your materials to "red team" their perspective. Visually inspect products before submitting them to AI analyses.

superficial understanding of how AI answers questions. A more effective beginner technique is to explore AI with a topic or document the student already knows quite well. Because the student already has an ample foundation of knowledge, they will better parse the flaws, nuance, and limitations of AI by exploring the tools with these texts. For example, a student who is an avid baseball fan might ask ChatGPT questions about what a baseball player should do in given situations or ask an AI product to provide historical comparisons of different famous players. The intent is to help the student learn the rhythms and responses that AI tends to give. By beginning with source material the student knows well, AI peculiarities become more apparent. This understanding helps the student later since they will limit their use of answers received from AI accordingly.

Dealing with hallucinations represents the most obvious concern in trusting AI responses. After all, if neither students nor staff could trust the output of AI tools, what purpose could there be in seeking their support? While continued innovation should limit the possibility for outright hallucinations to corrupt results in the future, several different techniques can minimize the challenges posed by AI hallucinations today. These possibilities include asking the AI to provide sources (or otherwise have some means of identifying evidence to support the answer), entering multiple prompts to contrast the output, inquiring AI for its reasoning behind an answer, and most importantly, double-checking the output information independently (Lakhani, n.d.). The last point is the most important, and it works best when asking AI to cite sources. Students can then independently verify whether the information produced is accurate. Granted, this advice is good for any potentially biased output, whether belonging to internet media or AI-generated content. Different AI platforms will readily adapt to outputting references in different preferred formats, yet the true opportunity is the chance to follow up and determine if the information appears legitimate. This step also requires less work than it might seem. Many scholarly search databases such as Google Scholar and PubMed index millions of scholarly articles. If the purported citations cannot be verified through one of these platforms, then the student should grow increasingly skeptical that the output might be an AI hallucination.

Two other possibilities address hallucinations and uncertain information through complementary approaches. First, multiple prompts allow the student to assess information reliability through consistency. This method does not mean simply rephrasing a question using different words. Instead, try approaching the question from another perspective. Some AI tools benefit from different personas that enable answering from another point of view. Consider an example of a leadership case study involving police reform in New York City (cf. Kim & Mauborgne, 2003).[1] A standard approach would involve asking an AI tool to summarize this article. Alter-

[1] This case study is also used in a U.S. Army Command and General Staff College leadership course (L100).

natively, the student could provide different contexts when asking AI for information by adopting a different perspective each time. This scenario would allow students to ask questions from the perspective of a police commissioner, an officer patrolling the streets, the mayor's office, media outlets, or even criminals. Each perspective should have different answers to certain questions, especially as attitudes and effectiveness of crime prevention techniques would be concerned. Adaptation to each question helps limit not just the possibility of hallucinations influencing the outcome, but this approach also creates a more holistic understanding of the situation. Moreover, this method enables another strategy to avoid hallucinations and dive deeper by asking AI its reasoning behind the information provided. Both law enforcement and criminal perspectives should give similar answers about basic facts such as dates within the story, yet each perspective should have different reasoning underlying its response to the intrusiveness of crime prevention techniques. If comparable answers are given for both, then the similarities should be a red flag that the student cannot fully trust the AI output, that the synthesis of information is marginal at best, or other possibilities that warrant a deeper dive into the material before accepting AI results.

Another technique is to utilize retrieval augmented generation (RAG; Rogers, 2024). RAG searches constrain the possible answers to a set of real documents to limit the possibility of hallucination. This technique could utilize a set of consolidated notes to limit the possible input or engage a search engine to pull in real documents. Granted, the AI prompt must further anchor responses only to the identified subset of documents and not all material encountered during initial model training. The latter possibility creates an opportunity for misleading results despite an active effort to avoid hallucinations because it remains reliant upon accepting AI output as genuine. Success thus depends on how effectively the AI tool can narrow focus only to relevant information without drawing upon its initial training or information outside the constrained set—essentially keeping an onus on the searcher to construct an effective prompt while narrowing the existing documents to be searched. As such, RAG does add value and limits hallucinations, although the output information would still benefit from citations, sources, or another means of confirming that the information is indeed genuine. Furthermore, there are a few different names for this technique. Some outlets might call it consolidated notes or related language describing the limited search parameters. Nonetheless, the important element is that answers become limited to a particular set of information rather than asking the algorithm to draw upon all previous facts and information it might have encountered.

Further techniques should only be employed once the student has developed some mastery with AI tools. Although these techniques unlock the greatest potential for AI assistance in military education, they also involve the most nuance and therefore require some base level of familiarization before they can be fully utilized. In short, these techniques allow prompt engineering to maximize AI outputs. Prompt

Table 2
Prompt Examples and Best Practices

Prompt	Key Points
"Tell me what I should know about this article."	Vague or incomplete request. No guidance about the type of information requested. No template given to structure the output into a more usable format. No detail about the desired length of response. Wording is not precise and could lead to confusion.
"Analyze the positive and negative elements of this article using the SWOT (strengths, weaknesses, opportunities, and threats) framework with a background section for broad overview and conclusion section of less than 500 words. The target audience for the summary is a classroom of students in professional military education at a graduate level."	Direct request with active voice. Specifics given about the type of information requested. Example format provided to structure the response. Detailed requirements for length. Precise wording likely to deliver clear results. Tailored to a specific audience.

engineering is the skill inherent to crafting questions that produce optimal outputs when entered into AI tools (Snow, 2023; see Table 2 for examples).

Every prompt will inherently have some sort of task or command since the user is asking an AI tool to do something. That said, not every prompt achieves the same quality of output, and prompt engineering becomes the art form that will differentiate individuals who excel when using AI tools and individuals who simply use their functions. For the task, military users should be familiar with the type of clear direction often recommended (Snow, 2023). An example might involve directing the AI to "summarize the key takeaways of the article," but this direction is only a starting point. Active voice helps, although tweaks could optimize the output. Layer requests by adding specific components desired in the output. For example, the same prompt could be improved by asking the AI tool to "summarize the leadership best practices in this article, include a bullet point summary of key takeaways, and provide a conclusion section of no more than 250 words." Specific requests written in an active voice help refine the task in ways that allow AI tools to produce a better output. Thus, optimal output can be achieved when describing the requested task with specificity.

Additional refinement can further augment the prompt, depending on the situation and tool in question. Some tools will benefit from examples that help provide

format and structure to the output. For example, rather than ask for the positives and negatives of a certain article, someone could frame the prompt as "analyze the positive and negative elements of this article using the SWOT (strengths, weaknesses, opportunities, and threats) framework with a background section for broad overview and conclusion section with key takeaways." Examples help refine the requested task into a more constrained format by providing the AI tool with context upon which to craft a response. If asking ChatGPT to identify good restaurants in the area, as another possible use, constrain the response with details like the quality, cost, location, type of food, or other details critical to any decision. Of course, any military-specific usage will be restricted by the type of information that can be entered into the platform. Some current guidance outright restricts commercial, off-the-shelf AI programs for use in any professional purpose given the risks of unsecure data storage, potential for hallucinations, and lack of transparency (U.S. Army Combined Arms Center, 2024). Professional military use cases should restrict AI use to approved platforms such as NIPRGPT or CamoGPT.

Other best practices in prompt engineering include the voice used in crafting the prompt. Remember, LLMs learned from enormous datasets that included a wide range of information, sometimes presented in different contexts. A biased voice or passive voice could prompt the AI tool to seek matching style, and so the response could be equally biased or passive in response to the prompt. Moreover, emotion can further change the context. Chatbots can be primed with encouraging words to perform better, but under most circumstances, a moderate amount of politeness achieves better results than flattery or aggression when crafting a prompt (Ziegler, 2024). Professional tone is often the best example when entering prompts into AI tools. Finally, for tasks someone will need to do repeatedly, users can keep a prompt database of inputs that have been successful during previous iterations. Over time, these prompts can be developed and refined even further to maximize the interactions. This possibility might be especially important for military users who eventually employ AI tools to develop orders or other highly structured tasks with common elements between iterations.

Of course, most of the discussion focused on student use of AI tools. There are also important applications for instructor use of AI in PME. One possibility would be to help adapt the curriculum to new material. AI could generate supporting images or instructors could explore new material when developing lesson plans. These additions could help instructors shape the curriculum with feedback from AI tools. That said, the role of the instructor becomes subject to similar advice and best practices given for the student. AI can provide ideas, yet the same hallucinations and false leads could deceive instructors the same way it might have students. Instructors should likewise proceed with caution if considering AI to facilitate their grading requirements. The best practice for either curriculum development or classroom instruction would be to brainstorm with AI support while double-checking all sources for accuracy.

Summary

AI tools have greatly evolved in recent years. The concept has advanced from a novelty to a practical toolset available throughout multiple facets of daily life from supporting education to making dinner plans in new cities. For PME, there are many possibilities that students could use to further their learning as AI tools can assist with large reading requirements and writing exercises. Nevertheless, especially in a military context, there are some evident downsides. AI bots could produce misleading results when they hallucinate, or improper citation could lead to confusion and accusations of plagiarism. As much as these tools have advanced recently, their integration into educational environments remains preliminary at best. Both teachers and students are attempting to identify the best practices of using AI to support a learning environment. For those individuals who choose to utilize AI tools in PME, perhaps the three best pieces of advice right now are

1. Never accept the full output of AI tools without double-checking sources.
2. Always properly cite uses of AI in academic work.
3. AI tools are best utilized as a supplement to enhance reading and writing exercises, not as a replacement for doing the work.

Disclaimer

The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the U.S. Army Command and General Staff College, Department of the Navy, Department of Defense, or the U.S. government. The author is a military service member. This work was prepared as part of his official duties. The author has no financial or nonfinancial competing interests in this manuscript.

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Tacit Knowledge Cultivation as an Essential Component of Developing Experts

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Abstract

As the U.S. military leans forward in shaping the future of military learning, it is essential to better understand and cultivate not only explicit knowledge acquisition but also the tacit knowledge that is needed to become an expert in any area (Army University, 2017). Understanding tacit knowledge and how it is transferred within the total force will improve the military's agility, adaptability, and speed of responding to any challenges presented by adversaries. To accomplish this, metrics need to be created and assessments must be developed that measure both explicit and tacit knowledge informing talent management, training, and employment of the total force for future military operations.

Introduction

I shall reconsider human knowledge by starting from the fact that we can know more than we can tell.

—Michael Polanyi, *The Tacit Dimension* (1966b, p.4)

Understanding the components of human knowledge has been studied and debated for decades, but scientists in general support the use of two categories of knowledge: (1) explicit knowledge and (2) implicit (tacit) knowledge (Mohajan, 2017; Purković, 2018). Additionally, there is renewed interest by the industry and military in the study of human knowledge and knowledge management to achieve a com-

petitive advantage over adversaries (Department of Defense, 2018; Mohajan, 2017; Seidler-de Alwis & Hartmann, 2008).

The authors will first compare and contrast tacit and explicit knowledge to set a strong foundation for the reader. The second section will underline how tacit knowledge is essential to improving the military's ability to remain competitive and resilient under volatile, uncertain, complex, and ambiguous situations. The third section will discuss assessments that have been created to measure tacit knowledge in a military population. Lastly, the article will conclude with a research-focused way forward to assess tacit knowledge transfer in military education and training to improve future military learning.

Explicit and Tacit Knowledge

Army Techniques Publication (ATP) 6-01.1 defines tacit knowledge as

> What individuals know; a unique, personal store of knowledge gained from life experiences, training, and networks of friends, acquaintances, and professional colleagues. It includes learned nuances, subtleties, and workarounds. Intuition, mental agility, and response to crises are also forms of tacit knowledge. (U.S. Department of the Army [DA], 2015a, p. 1-3)

In contrast, ATP 6-01.1 states that

> Explicit knowledge is codified or formally documented knowledge organized and transferred to others through digital or non-digital means. Explicit knowledge has rules, limits, and precise meanings. Examples include computer files, dictionaries, textbooks, and Army and joint doctrinal publications. (DA, 2015a, p. 1-3)

The father of tacit knowledge, Michael Polanyi, (1966a) described tacit knowledge by using a bicycle analogy. He asserted that being able to ride a bike had nothing to do with reading about riding (explicit knowledge) but more about being able to find one's own balancing point and coordinate multiple muscles to successfully ride the bike without awareness of doing so (tacit knowledge). Other examples of tacit knowledge are: playing sports (Gerrard & Lockett, 2018); making bread (Nonaka, 1991); playing music (Mládková, 2008); conducting medical procedures (Edmonson, Winslow, Bohmer, & Pisano, 2003); and making leadership decisions (DA, 2015b). In fact, many military activities, like conducting key leader engagements and advising and assisting partners, rely heavily on tacit knowledge acquisition (Brown, 2018; Nash & Magistad, 2010).

As stated by Polanyi (1966b) in the epigraph, it is possible that there is knowledge that is difficult to convey with words, but how much of that tacit knowledge can be explicated is yet to be determined in the literature. It is likely that learning is a continuum of acquiring and integrating knowledge that makes measurement of both explicit and tacit knowledge difficult to fully tease apart. As stated by Seidler-de Alwis and Hartmann (2008), "Tacit and explicit knowledge are complementary, which means both types of knowledge are essential to knowledge creation" (p. 134). Luckily though, philosophers, educators, and practitioners have spent decades evaluating how humans learn and the types of knowledge that are gained from different experiences. In addition, much is known about the factors that influence learning and, specifically, tacit knowledge.

From the literature, knowledge can be categorized into "strings and things" (Collins, 2010, p. 85) or depicted as a continuum, as mentioned above. If the salient features of tacit and explicit knowledge can be identified and the features are distinct, researchers can categorize and measure the knowledge separately. Jasimuddin, Klein, and Connell (2005) identified salient features of explicit and tacit knowledge. Specifically, explicit knowledge is categorized by information that is codified, easy to articulate, communicated and stored in media and other concrete physical locations, impersonal, and owned by an organization not an individual person. The opposite of each are the factors that relate to tacit knowledge: noncodified; personal; difficult to articulate, communicate and store; located solely in the individual's brain; acquired through face-to-face exchanges, like storytelling; and owned by the organization and its members.

The problem with categorizing knowledge into two discrete boxes is that you may miss the important overlap that exists if learning is indeed a continuum. There is also a danger in forcing an artificial categorization where you misrepresent the knowledge to make things look neat and orderly. On the other hand, the benefit of categorization is that it is a place to start, especially when it comes to learning how to improve the knowledge acquisition.

Those that advocate knowledge as a continuum endorse the view that "tacit knowledge and explicit knowledge are the poles of a knowledge spectrum" (Jasimuddin et al., 2005, p. 104), but they clarify that there is value in understanding the

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overlap between explicit and tacit knowledge. Chen, Snyman, and Sewdass (2005) make a great point that "the spiral that operates between tacit and explicit knowledge continually effecting [sic] new knowledge among workgroups creates the energy and innovation that characterizes an active knowledge-intensive and knowledge-creating organization" (p. 6). This insight highlights the importance of studying tacit knowledge not only to understand how military personnel learn but also how new knowledge is created within a learning organization.

Focusing on individual learning and the continuum of explicit to tacit knowledge, consider a soldier skill like shooting an M16 rifle. According to the U.S. Department of the Army's Field Manual (FM) 3-22.9 (2008), *Rifle Marksmanship M16/M4 Series Weapons*, soldiers begin their training by learning the "firing fundamentals, which are taught in four phases—preliminary marksmanship instruction, downrange feedback, field firing, and advanced firing exercises" (p. 1-1).

In the first phase, soldiers are given a four-hour class where they learn the components of the weapon, how to assemble and disassemble the weapon, and how to clear it. They memorize the weight of the weapon (with/out a sling), the operational characteristics, and the maximum effective ranges. The knowledge acquired in the class is explicit knowledge about the facts of shooting, but it will not make someone a marksman, much less an expert.

The majority of learning to be a marksman occurs through actually holding and shooting the weapon. This is the tacit knowledge development that is personal and intuitive. Phases 2, 3, and 4 emphasize the importance of practice, feedback, and adjustments to shooting behaviors, as represented in Figure 1.

Soldiers practice shot grouping, shooting from different distances and positions while receiving concrete feedback from the holes left on the targets and pointers from the coaches. Adjustments are made in posture, breathing, and trigger squeeze that result in improved performance. "When troubleshooting the fundamentals, the coach's imagination is the only limiting factor" (DA, 2008, p. 5-14).

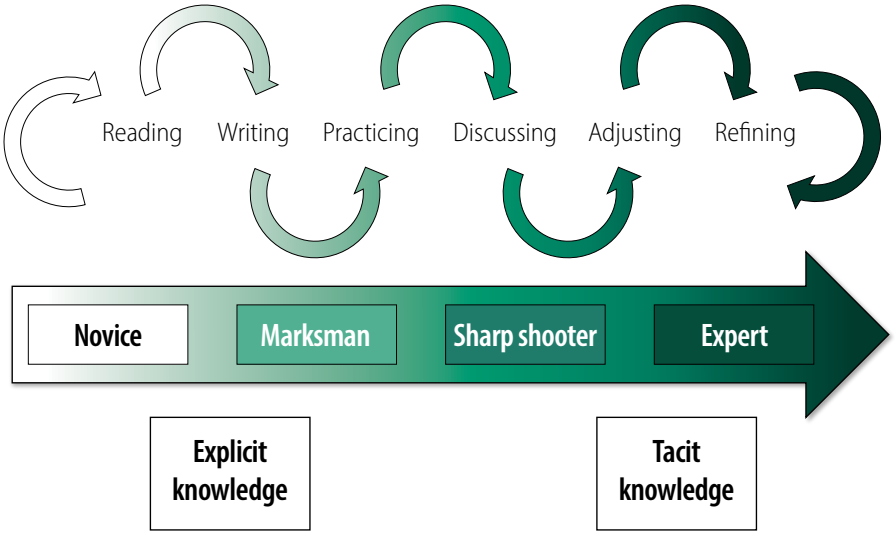
Depending on the soldier's unit, advanced training may include moving targets, shoot houses, different terrain and weather conditions, and targets with friendly or enemy silhouettes. There may be more explicit knowledge integrated into the tacit knowledge by reading about advanced skills, receiving in class instruction from coaches, then adding advanced tacit knowledge through practice in simulated and live environments.

Learning to be an expert shot begins with concrete, explicit knowledge of the weapon, but the majority of the learning comes from the tacit knowledge from practice, feedback, and adjustments made while shooting. In summary, as stated by a soldier who has consistently achieved perfect scores on his qualification exams:

> To become an expert, the experimentation and feedback cycle is important in that it allows soldiers to control one's own learning, thus achieving more than

Figure 1

Continuum of explicit and tacit knowledge and the iterative process to become a marksmanship expert. Figure by authors.



they thought was possible, reinforcing and motivating them to do better, even hitting 40 out of 40 targets. (Specialist First Class W. O. Gray, personal communication, 26 September 2018)

In Figure 1, the development of knowledge is depicted on a continuum from explicit to tacit where learning is iterative and integrated. It is important to note that the amount of explicit versus tacit knowledge needed to develop a skill may be different. Specifically, Mohajan (2016) estimates that "about 90% of the knowledge in any organization is embedded and synthesized in tacit form" (p. 10). Similar to our marksmanship example, only a small portion of the knowledge needed to become a marksman comes from the explicit knowledge learned from reading Army manuals and classroom instruction. The majority of learning relies on the acquisition of tacit knowledge through practicing, discussing, adjusting, and refining the shooting skills. So how can the Army ensure that soldiers receive the correct amount of explicit and tacit knowledge to become a marksman? How much more is needed to become a sharpshooter or an expert? What are the influencing factors that help or hinder the learning? Can any soldier become an expert, or are there aspects of the behavior that can't be learned, as posited by Polanyi (1966b)?

The first step to answering these questions is to recognize the importance of assessing the knowledge over time and identifying the requirements that are needed

to establish when an individual has become an expert. For marksmanship, the Army has done a great job in establishing what it takes to become an expert (DA, 2008). Doctrine has identified concrete skills to measure and present many recommendations to improve performance. Other skills in the Army are less well defined. For instance, hard skills like shooting are different than soft skills such as advising.

According to Brown (2018), "Current U.S. military doctrine identifies twenty-six personality traits that are desirable in advisors" (p. 1). Of the 26, he identified the five most important traits from his personal experiences as an advisor and trainer: empathetic, humble, visionary, diplomatic, and self-aware. Additionally, the Security Force Assistance doctrine (DA, 2009) identifies additional individual and collective skills that are required to be a good advisor. A sample of these skills presented in FM 3-07.1, *Security Force Assistance*, are: "communicate across cultures, build rapport, influence, and negotiate" (p. 7-4). These traits and skills are very nuanced and sophisticated. Further, it is the combination of the needed traits and skills together that result in the best advisors.

While advising is far more complex than marksmanship, the Army has spent much time and effort in identifying and training the needed knowledge, skills, and behaviors that are required to be a good advisor. But what about an expert advisor? According to Kauffman (2018), "initial coverage of the SFAB [Security Force Assistance Brigade] suggests that the curricula are still not comprehensive enough for our forces to operate successfully in the human domain" (p. 89). It is clear that there is more to be done to understand, cultivate, and transfer tacit knowledge of the softer skills required to win in a complex world.

Tacit Knowledge and Winning in a Complex World

A major reason underlying this gap in curriculum and training is the growing complexity of the operational environment. The Army's FM 3-0, *Operations*, states, "Army operations take place in the most complex of environments, on land among humans who have fundamental disagreements" (DA, 2017a, p. 1-4). Additionally, as described by Schatz, Fautua, Stodd, & Reitz (2017), "Globalization, ever-increasing computing power, and the proliferation of low-cost advanced technologies have created a level of worldwide complexity never before seen" (p. 78). This growing complexity makes military operations exceedingly difficult. To be successful in a volatile, uncertain, complex, and ambiguous environment, military personnel need to respond to enemy actions swiftly and completely (DA, 2017a). They need to learn quickly and act with confidence like an expert. If they have developed their job-related skills beyond explicit to tacit, they can respond quickly and effectively to any challenge presented to them, but the military needs to be sure they acquire that tacit knowledge.

At the organizational level, if the military is able to identify and tap into tacit knowledge across the enterprise, it can employ the talent more quickly and effectively. Additionally, if processes are in place and assessments are created, understanding how to accelerate tacit knowledge transfer could result in better training for future, yet unknown skill sets. Specifically, Durant-Law (2003) states that by becoming a learning organization, a business is able to capture and explicate the tacit knowledge within its workforce. By using mechanisms that encourage employees to codify and share their tacit knowledge, companies will "operate on a higher plane, which allows it to predict outcomes, adapt to changing circumstances, and above all to be innovative" (Durant-Law, 2003, p. 1).

In many ways, the military does this already. After action reviews are a great example of codifying and sharing information about what worked or did not work after a mission. "Right seat rides" are formal activities that units use to transfer tacit knowledge from a unit on the ground to the unit that will be relieving them in place. Also, soldiers may develop continuity books to explicate the tacit knowledge that they acquired during their deployment to be shared with those replacing them for a smoother transition of roles and responsibilities. Unfortunately, when these and other methods are not used effectively, there is a great loss of institutional knowledge that cannot easily be reacquired (Şensoy, Keskin, & Orhan, 2015).

There are also many factors that influence learning in general that make the path to becoming an expert more challenging. The literature identifies numerous factors that influence learning, especially when considering adult learning. *The U.S. Army Learning Concept for Training and Education: 2020-2040* specifies six core principles of adult learning: "the learner's need to know; self-concept of the learner; prior experience of the learner; readiness to learn; orientation to learning; and motivation to learn" (DA, 2017b, p. 26).

For explicit information, like memorizing the characteristics of an M16, the soldier's need to know, prior experience, readiness to learn, and motivation to study will impact how well he or she will perform in the first hours of marksmanship training. Those factors also impact the development of tacit knowledge. The soldier needs to be motivated to practice the marksmanship behaviors, have strong self-awareness of his or her body to know the correct posture, breathing pattern, and trigger pull sensation, and be able to draw from previous experiences to fire effectively on a target.

Regarding tacit knowledge specifically, because of the experiential and personal nature of that learning, an important factor for effective acquisition of tacit knowledge is the feedback that is given when learning a skill. The feedback needs to be consistent, clear, and relevant to the learner. Effective feedback helps the learner know what "right looks like." The feedback also needs to be immediate so the learner can evaluate why his or her behavior hindered their performance and make the needed adjustments. The longer the delay between the actions and the feedback, the greater the likelihood that the learner will not be able to correct and, thus, improve his or her performance.

The *U.S. Army Learning Concept* highlights the importance of providing feedback to students by including it in the analysis, design, development, implementation, and evaluation process for developing learning products to facilitate adult learning (DA, 2017b). Additionally, the *Army Learning Strategy* states that Army leaders should provide meaningful feedback and consider delivery mechanisms that are "skillfully framed and appropriately delivered" (Army University, 2017, p. 12).

Another area of research that has focused on the factors that influence knowledge acquisition is the comparison of novice and expert performance. A major difference between a novice and an expert is how they look at a problem. A novice has little experience to rely upon so they must methodically and explicitly break down a problem and may struggle with what to focus on and what to ignore. An expert has both knowledge and experience to apply to a problem, seeing it in a more abstract way to visualize the larger picture and not be distracted by irrelevant information (Hinds, Patterson, & Pfeffer, 2001).

Charness, Krampe, Reingold, Tuffiash, & Vasyukova (2005) demonstrated that the single most important factor that predicted expert versus novice chess performance was deliberate practice. Players must "engage in several thousand hours of concentrated analysis and memorization of chess tactics and positions in order to build the knowledge base necessary to achieve regular success in highly competitive chess tournaments" (Charness et al., 2005, p. 163). The authors also indicated that expert chess players must self-regulate themselves during a tournament. This includes managing time effectively, avoiding distractions, and controlling negative emotions. From this research, explicit and tacit knowledge working together results in expert performance. It also highlights the importance of repetition (physically and mentally) and the emotional factors that can impact performance.

Confidence from repetitions of success and coming back from failure is also important to reaching expert levels, especially in difficult tasks. Unfortunately, overconfidence could have the opposite effect, where an individual does not take the time to consider the physical and emotional factors in play and lose his or her focus. Lastly, repetition reduces learning decay that can happen with perishable skills, like shooting effectively.

Measuring Explicit and Tacit Knowledge

Now that tacit knowledge has been defined and described and factors influencing military learning have been presented, the main question to be answered in this article, especially for the warfighter, is "How can explicit and tacit knowledge be measured?"

Explicit knowledge assessment is well known. These are the tools that are used in traditional classroom environments to assess student learning or on promotion

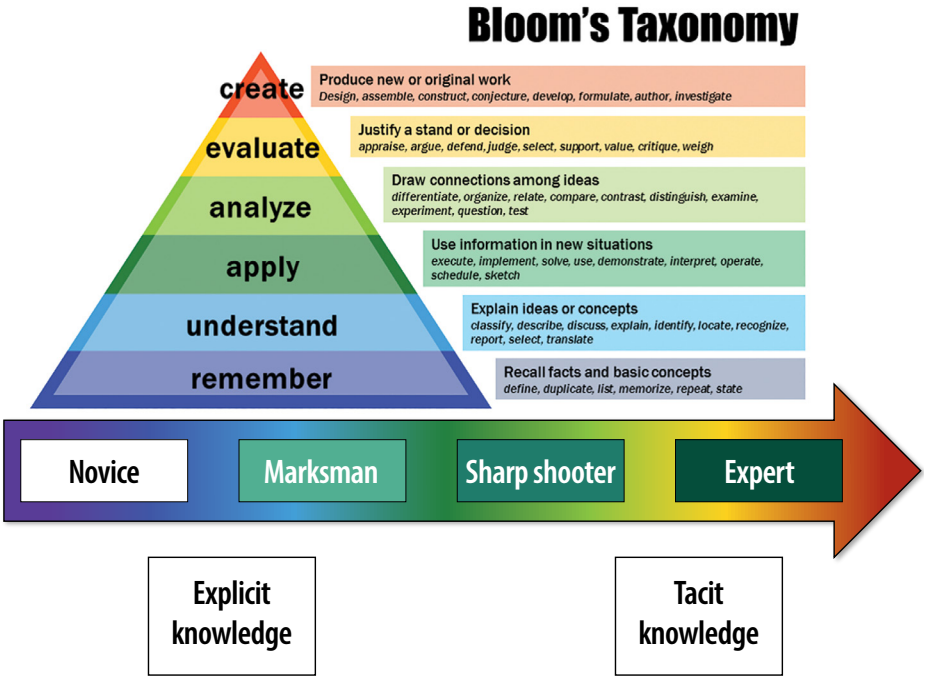
boards to assess a soldier's comprehension of facts relevant to his or her job. These assessments range from basic true or false statements, to more complex scenario evaluations where how to do something well is easily communicated through written and verbal exams and easily graded using rubrics.

The effort to measure explicit knowledge is aided in part by the Army's adoption of Bloom's Taxonomy and the six cognitive levels (DA, 2013). The original taxonomy was revised in 1956 and currently identifies the six cognitive dimensions as: remember, understand, apply, analyze, evaluate, and create (Krathwohl, 2002). The first level assesses an individual's ability to remember facts and recall information. The next level pertains to an individual's ability to explain the information, not just regurgitate the facts. The third level involves the application of the information in new, unique ways. This level appears to represent the overlap between explicit and tacit knowledge in that known facts, perhaps gained via explicit learning processes, are applied to different situations or problems based on previous experiences. The fourth level entails the ability to compare and contrast related situations or problems to develop a deeper level of understanding and thus facilitate the next level in decision making through evaluation. The sixth and final level is "creating." This is where the "new knowledge" is produced. Krathwohl (2002) defines the create level as "putting elements together to form a novel, coherent whole or make an original product" (p. 215).

Using Bloom's Taxonomy levels, the shooting analogy can be further dissected as an example of learning levels and related tacit knowledge development (see Figure 2). At the first level of "remember," the soldier is able to remember the components of a M16, its weight, and the maximum effective ranges when shooting it. At the next level, the soldier demonstrates "understanding" by explaining how the weapon is constructed, how to set the sights, and the factors that influence hitting the target. Regarding "application," the third level, the soldier must demonstrate how his or her understanding of the mechanics of the weapon actually result in effective shooting. That is, he or she must physically apply the explicit knowledge and develop further his or her tacit knowledge through practice to qualify at the range. If challenged to hone their shooting skills at a higher level of analysis, the soldiers will experience shooting in different situations, different positions, and possibly using different weapons. This practice helps the soldiers develop more deeply their individual shooting behaviors (e.g., breathing, trigger squeeze, eye relief) by enhancing their tacit knowledge through practice. Unfortunately, practice by itself is not enough to become an expert shot. At the next level, "evaluation," the individual must check and critique his or her behavior (hopefully with the assistance of a knowledgeable coach providing actionable feedback). Without the quality feedback, continued practice may actually result in the development of bad habits reducing the likelihood that the individual will be able to become an expert shot. With the assistance of an expert qualified coach/mentor providing insights and feedback to the soldier, together they "create" new knowledge about how that individual can become an expert shot. This

Figure 2

Continuum of explicit and tacit knowledge compared to Bloom's Taxonomy to depict steps to becoming an expert shot. Bloom's Taxonomy figure courtesy of Vanderbilt University Center for Teaching. Composite figure compiled by authors.



new knowledge can then be shared with others within the organization to help novices become expert shots.

By categorizing tacit knowledge into the levels of Bloom's Taxonomy, a method of measurement of tacit knowledge is also provided. That is, when a soldier's shooting skills are at the creation level, where he or she is creating new knowledge via developing enhanced techniques and procedures, it is known that they have maximized the acquisition of tacit knowledge. Whereas, at the application and evaluation levels, the soldier is shooting well but has not yet created new knowledge that results in perfect shooting performance in any fighting situation.

Another approach to measuring tacit knowledge was developed by Robert Sternberg and colleagues (Antonakis, Hedlund, Pretz, & Sternberg, 2002; Cianciolo, Anotonakis, & Sternberg, 2001; Hedlund, Antonakis, & Sternberg, 2002; Hedlund et al., 1998; Horvath et al., 1994a, 1994b; Matthew, Cianciolo, & Sternberg, 2005; Sternberg et al., 1999). Unlike most of the other research assessing tacit knowledge,

these efforts were specifically focused on a military population. It is for this reason, the authors will present the team's findings as a possible way forward for measuring military learning.

Sternberg and his team based their efforts on Sternberg's triarchic theory of intelligence, specifically related to his research on practical intelligence. This was a valid course of action because practical intelligence has been shown to encompass tacit knowledge (Wagner & Sternberg, 1985). To begin the research effort, Horvath, et al. (1994b) conducted an extensive literature review of tacit knowledge and military leadership. They divided tacit knowledge into three categories: (1) intrapersonal, (2) interpersonal, and (3) organizational. Intrapersonal tacit knowledge consists of information about oneself—specifically, an individual's level of self-awareness, self-motivation, and self-organization. The interpersonal domain focuses on the knowledge about behaviors of other people. This would include an individual's ability to influence, cooperate with, and understand others. The organizational domain consists of behaviors related to the organization. The authors focused on how organizations optimize their work force, how they define the organization, and to what extent the organization has a vision for the future. The authors acknowledged that the categories are not mutually exclusive, but by creating the framework, they felt confident that tacit knowledge could be measured and used to predict job performance.

Horvath, et al. (1994a) continued the research by developing a tacit knowledge instrument to measure tacit knowledge in military leaders. The authors conducted semistructured interviews with 81 active duty Army officers from combat arms, combat support, and combat service support units. The interview data was coded and sorted for different examples of tacit knowledge used by Army leaders to address complex problems. Their findings indicated that for platoon leaders, these milestones included self-management and the establishment of credibility with others. For company commanders, these milestones included balancing company and battalion level interests. For battalion commanders, these milestones included managing organizational change and communication (Horvath et al., 1994b, p. vii).

The results provided the raw data used by follow-on research to further evaluate how tacit knowledge could be measured with military personnel. Horvath, et al. (1996) used the previous findings with additional survey data to create a model of tacit knowledge. In addition, several research products were developed by Horvath, et al. (1998) to be used in the work conducted by the research team and others from 1998 to 2008. They demonstrated that officers' and noncommissioned officers' tacit knowledge could be measured using sophisticated scenario instruments and correlated to other measures of leadership effectiveness, self-knowledge, and organizational culture (Taylor, Higley, & Grabarczyk, 2008).

Most relevant to this paper is the process used to develop valid measures of military personnel's tacit knowledge. The first step was to conduct interviews with a sam-

ple of the target population to extract stories and insights gained from job-related experiences. Horvath, et al. (1994a) included a sample interview protocol. The next step would be to conduct a content analysis of the raw data to establish examples of tacit knowledge, which can be sorted to create a category framework. Horvath, et al. (1996) included an example of several categories of tacit knowledge items such as: "dealing with poor performers," "establishing trust," and "managing the self" (p. 18). The categories were used to develop preliminary inventories. The inventories contained scenario-based questions where the participants rated the possible responses from "extremely bad" to "extremely good" based on what they would do in that situation. For example, Hedlund, et al. (1998) used the scenario, "You are a company commander with some relatively junior lieutenants. Your goal is to develop these lieutenants. Rate the quality of the following strategies for achieving your goal" (p. B-18). Sample choices included: "Involve the lieutenants in every administrative action in the company"; "Involve the lieutenants only in those decisions that affect their platoons"; and "Tell the lieutenants when things in the battalion are bothering you" (p. B-18). Participant experiences and other demographic information were also collected to identify levels of job experience.

Additionally, subject-matter experts were used to establish the "expert" answers. This is generally done using survey data asking experts to rate the items on several dimensions. The results can be used to identify which items discriminate between experienced and novice answers. Lastly, the findings informed the final battery of measures of tacit knowledge that were used for follow-on research.

This process can be duplicated with a focus on any military learning environment to assess the explicit and tacit knowledge acquired. Further, research could ascertain the balance of explicit versus tacit knowledge needed to become an expert in specific military occupational specialties. For instance, to become a successful advisor, how much explicit knowledge is required before attending training at a combat training center where the tacit knowledge needs to be honed before deployment? Lastly, by understanding the needed explicit and tacit knowledge that must be acquired to become an expert in a particular skill, the military might be able to create new education and training programs that accelerate the knowledge transfer, making it more agile in meeting future fighting requirements.

Future Research

Other methods to measure knowledge transfer exist in the literature but are focused on nonmilitary populations. Future research should consider this literature and incorporate the methods, especially if they provide less complex, yet scientifically sound processes. Interestingly, the recommendations made by Schatz, et al. (2017) closely align with other ways to measure tacit knowledge using performance

measures, competency models, maintaining robust data management systems, and collaborative learning approaches.

Numerous performance measures and competency models exist that could inform different ways of measuring tacit knowledge (MacLean, Kerr, & Qaseem, 2018; Russo, 2016; Stecher & Hamilton, 2014). There is also a growing body of literature investigating better ways of managing knowledge (Barley, Treem & Kuhn, 2017; Chen et al., 2005). In addition, there are several collaborative learning approaches, formal and informal, that the military could adopt or refine to further develop tacit knowledge. Some examples would be use of learning histories, whisper courses, sketch-noting, smart phone apps, game-based learning, mechanisms for remote team building, strategies to improve productive discourse, etc. Anything that can help explicate an individual's tacit knowledge transfer to others in a timely manner would benefit military readiness.

It is clear that military learning encompasses both explicit and tacit knowledge that to some extent can be known, measured, and shared across an enterprise. Additionally, effectively managing this knowledge throughout an organization facilitates improved institutional effectiveness, innovation, and resiliency (Mohajan, 2016, 2017).

In conclusion, the U.S. military has many of the pieces in place to successfully identify, measure, and transfer tacit knowledge throughout its organization but more work needs to be done. Stated eloquently by Schatz, et al. (2017), "The timing is right to unleash the full potential of our Human Dimension. All the resources are here—science, technology, and the demand—and all we need is a shared strategy and the will to pursue it" (p. 89).

Having discussed tacit knowledge in depth and argued that measurement is indeed possible, the authors would like to provide a few research questions for future study based on the hypothesis that identifying ways to accelerate tacit knowledge acquisition can improve Army readiness.

1. Does an increase in explicit knowledge acquisition before training and/or education events benefit the development of tacit knowledge? Thus, improving performance downrange?

2. How does motivation, self-awareness, and self-reflection impact tacit knowledge acquisition?

3. What are the ways to codify tacit knowledge into Army tactics, techniques, and procedures and lessons learned that lead to enterprise-level best practices that can be effectively managed and efficiently transferred across the organization?

4. How effective are collaborative learning techniques in increasing tacit knowledge transfer from experts to novices? Can these techniques improve observer, coach, and trainer feedback to students at training centers?

5. Can simulations improve tacit knowledge development, or are there limitations to what tacit knowledge can be gained from them? How much does the level of simulation fidelity matter?

6. At what point in education and training does practice reach its peak of effectiveness, and when do gains in developing tacit knowledge require real experience?

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Storytelling as an Instructional Technique

Recommendations for Military Instructors

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Abstract

Military educators intuitively use storytelling in their classes to illustrate key instructional points, demonstrate practical application, and maintain student interest. Shared experiences among students and the instructor are often central to the methodology used to train soldiers and officers on critical skills and knowledge. The purpose of this study was to generate principles for preparing and delivering stories in a military training context. The study explored the storytelling experiences of 15 military instructors and their students in officer education courses at three Army schoolhouses. Instructors reported telling stories from personal experiences to enhance student understanding and motivation, and students described instructors' storytelling as beneficial and, in some cases, essential to their success in the course. Instructor storytelling contributed to both instructor and subject matter credibility, encouraged application and synthesis of the material, and improved the instructor/student relationship overall. The study combined analysis of instructor and student experiences with previous research findings on adult learning, storytelling, and effective instruction to generate practical guidelines for the use of personal stories to enhance learning outcomes.

Background of the Study

The connection between stories and education is a natural one represented in the root of the word "story" itself. The word story is derived from the Greek word for "history," which means one who is "wise" and "learned" (Seidman, 2019). The origins of narrative traditions—oral histories that serve to preserve and pass down vital information through generations—were established even before humans began recording history (Bowman, 2018). Educators often recognize the value of a good story in teaching and use narrative in ways that enhance learning, providing relevant illustrations that aid the recall of information.

Storytelling has been the subject of extensive research, with studies supporting storytelling to bolster positive relationships between instructors and students as well as between leaders and subordinates, and to enhance student engagement in a variety of educational settings (Adams et al., 2007; Auvinen et al., 2013; Sabio & Petges, 2019). Stories "have the potential to influence culture and to help people connect, develop genuine understanding, and unite around common purposes" (Aidman & Long, 2017, p. 106). An effective story can "encapsulate, contextualize, and emotionalize a message" (Pink, 2005, p. 104). Perhaps an even more powerful outcome of the use of stories in an educational context is the connection between the instructor and student and how that connection impacts the outcomes of the training or educational program.

The purpose of this study was to generate recommendations for using storytelling as an instructional technique in military training and education programs. Through a review of the literature on effective storytelling and the investigation of experienced instructors' use of storytelling in military education courses, this study was designed to generate knowledge that may apply to effective instructor training and education on the topic of storytelling as an instructional technique in military training and education.

Relevance of the Study

This study aimed to contribute to the literature on storytelling in adult education learning environments and explore the impact of instructor storytelling in military training courses. While a significant body of literature exists connecting storytelling to positive outcomes in management and leadership and in college classrooms, a search of existing studies finds no specific research on connections between storytelling and outcomes in a military setting. In addition to gaps in the literature on storytelling, findings on instructor credibility and self-disclosure have primarily been presented in the context of undergraduate college courses. This study sought to explore the perceived impact of those instructor behaviors in a military context as well. By informing the literature and providing practical recommendations, the research-

er's primary goal was to offer simple and achievable ways to improve instruction in military training and education.

Review of the Literature: Instructional Effectiveness and the Neuroscience of Storytelling and Adult Learning

The scholarly literature on adult learning and instructional effectiveness provides foundational background for this study. Specific areas of relevance include the study of instructor credibility and self-disclosure, narrative instructional techniques, and the neurocognitive link between stories and learning. Prior research in these areas informed the research questions in the study and provided insight when exploring the findings and implications of this effort.

Instructional Effectiveness: Credibility

A significant body of literature on instructional effectiveness has focused on the issue of instructor credibility, with consistent findings that correlate instructor credibility with student outcomes, motivation, and cognitive learning. Stoltz et al. (2014), for example, propose that "teacher credibility may be the most important factor in the instruction process" (p. 167). In a study on verbal aggression in the college classroom, Myers (2001) asserts that instructor credibility is one of the most important variables in the relationship between instructors and students. Myers (2001) maintains that if a student does not perceive that the instructor is credible, the pair is unlikely to develop a positive or meaningful relationship, which can inhibit the student's ability to learn.

Contributing to the research on instructor effectiveness and building credibility, researchers have explored the impact of instructor self-disclosure on student impressions of the instructor. For example, uncertainty reduction theory maintains the notion that in order to develop a relationship with someone, a person must gain information about another person, develop trust, and thereby reduce both cognitive and behavioral uncertainty between the two parties. According to the tenets of uncertainty reduction theory, appropriate self-disclosure can decrease uncertainty

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and increase communication and positive affect (Aidman & Long, 2017). In instructional settings, instructors who disclose relevant and appropriate personal information increase perceptions of caring and affinity with students' experience (Myers & Bryant, 2004). This was demonstrated in a study of college students' perceptions of their instructors, effectively self-disclosing information relevant to the students or the course material. It resulted in a positive impact on perceptions of the instructors' character, caring, and competence, which are the three components of credibility (Myers et al., 2009).

Instructor credibility can be positively influenced by the instructor's self-disclosure. Meluch and Starcher (2019) study instructor disclosure of communication apprehension and its impact on public speaking and student perceptions of instructor credibility. The study found that students rate instructors who disclose personal experiences of communication apprehension as more competent than instructors who do not disclose this type of information. Further, Meluch and Starcher's results indicate that students perceive instructors who share personal experiences with their students as important resources to overcome their own apprehension. Instructors who use self-disclosure are perceived as supportive and competent. These results echo previous research by Downs et al. (1988), who found that instructors who used self-disclosure and personal narratives at a higher rate to clarify course content were rated more highly when compared to their counterparts who did not use these techniques as often.

Instructor self-disclosure not only impacts the student's perception of the instructor but also has a positive connection to cognitive learning. In a study investigating whether teacher self-disclosure increases student cognitive learning, Stoltz et al. (2014) found that self-disclosure is a significant predictor for test scores on definitions. They also found that self-disclosure marginally predicts perceptions of relevancy in a sample of 102 university students when Stoltz et al. (2014) compared lecture and self-disclosure to an otherwise identical lecture without self-disclosure. In a study of large class sizes in a university environment, Solis and Turner (2016) found that instructor self-disclosure "expressed to students a likeness between the instructor and students" (p. 37) and promoted positive student-instructor interactions. Students indicate that instructor self-disclosure and caring leadership makes the class feel smaller. Students report that when the instructor shares personal experiences and stories related to course material, student motivation to learn and attend class increases as a result. Appropriate situational self-disclosure by instructors is one way instructors can bolster their relationship with students and enhance learning outcomes.

The Neuroscience of Narrative

Consideration of cognitive facets of neuroscience further illustrates a narrative's potential power in education and training. In their study exploring how aspects of successful psychotherapy might be used to enhance learning, Cozolino

and Sprokay (2006) suggest principles that link storytelling to learning through prior findings in neuroscience that explore the social and emotional aspects of the brain. They find that the experience of listening to a story activates multiple parts of the brain simultaneously, combining sensory images, logic, and words, resulting in an emotional response that strengthens connections in the listener's memory (Cozolino & Sprokay, 2006).

In 2010, Princeton University neuroscientists Stephens et al. (2010) examined brain function and storytelling, with findings that underscored the social aspects of the brain. In their research on verbal communication and neural coupling, they paired speakers and listeners whose brain activities were monitored through MRI scans. One person in each pair told a story from his or her own experience while the other listened. The brain scans reflected "mirrored" activity; the brain scans were synchronized in activity in the same areas of the brain, with a slight delay on the listener's part. In other words, the functioning of these "mirror neurons" indicate that the listener has similar brain activity as if he or she experiences the story in the same way as the speaker. This synchronized, empathetic perception has the potential to support positive outcomes in educational settings.

Storytelling as an Instructional Technique

In educational contexts, narratives provide a form of experiential learning in which the learner encounters experience through stories, forming new neural connections to solidify knowledge gained (Clark & Rossiter, 2008). In classrooms, the use of case studies, instructor stories, or students' sharing of personal stories often serves as the shared concrete experience that initiates the cycle of learning that Kolb's (1984) experiential learning model prescribes. Forrest and Peterson (2006) maintain that when adults share their own experiences, they are sharing their stories, naturally linking experiential learning and storytelling as instructional methodology. Similarly, Clark and Rossiter (2008) emphasize the linkage between experiential and narrative learning, arguing that learning through experience is, at its foundation, a narrative construction of knowledge. Sometimes referred to as narrative pedagogy, storytelling in education is effective for teaching complex thinking skills because "it encourages students to challenge their assumptions and think through and interpret situations they encounter from multiple perspectives" (Grendell, 2011, p. 65).

McNett (2016) suggests that stories provide a type of virtual practice for the brain, stating that stories work our "mental muscles" in the same way that physical play sharpens motor functions. In discussing this phenomenon, McNett cites Gottschall's suggestion that "stories act as cognitive flight simulators that help us practice without consequence navigating human and social life" (Gottschall, 2012, as cited in McNett, 2016, p. 185).

Methods

The study was conducted at the Maneuver Support Center of Excellence at Fort Leonard Wood, Missouri, a training institution that houses three Army branch proponent schools and provides training from entry-level basic training through professional military education courses for both enlisted soldiers and officers. The population of the study was comprised of experienced instructors and students in three Captains Career Courses. Respondents consisted of 15 of the 32 current instructor/small group leaders from the instructor faculty in the three courses and their students. Instructor volunteers were recruited through email requests with permission of the course managers and directors of training at each school. After discussion with the course managers, the pool of participant candidates was narrowed to those with at least six months of experience as a small group leader. This generally equated to an instructor having taught the full 20-to-24-week course at least once. The courses in this study are taught in small groups of 12 to 16 students per small group leader. Nine students participated from the current courses in session, with students recruited from classes that had been in session for longer than one month, to provide an adequate base of experience with the small group instructor.

Sampling

When the goal of the research is to understand a concept or theory, Creswell (2012) recommended the use of theory or concept sampling. This purposeful sampling strategy samples individuals or sites because they can "help the researcher generate or discover a theory or specific concepts within the theory" (p. 208). In this case, a comparison of instructor impressions, student reactions, and findings from the literature intended to explore the concept of effective storytelling as an instructional technique. The sample was derived based on the availability and willingness of the current population of experienced small group leaders and students from three schools to participate in the study. Once data collection had begun, the researcher encountered some reluctance in volunteer availability and willingness to participate. At that time, additional snowball sampling (Creswell, 2012) was used to generate additional participation, with volunteers providing an endorsement to a second solicitation for respondents.

Research Questions

Data collected in the study focused on the following research questions:

- RQ1: What are the experiences of military instructors in using storytelling as an instructional delivery technique?

- RQ2: How do students perceive the role of storytelling in their learning experience?
- RQ3: What characteristics of effective storytelling are reflected in incidents that experienced instructors described in a military training and education context?
- RQ4: How well does current instructor training for new military instructors provide preparation for the use of stories as an instructional technique?

Data Collection Methods

Data collection for the study consisted of semistructured interviews and the critical incident technique (CIT), along with a review of the current instructor training curriculum for military instructors. In this study, interviews focused on instructor and student experiences with storytelling in their classes to explore instructors' perceptions about how stories affect student motivation and learning outcomes.

Questions used in instructor interviews included general inquiry about whether they use stories in their classes and how they deliver the story (e.g., planned or spontaneous; personal or third person).

As a starting point for the interviews, instructors were asked to describe their intent when using stories and their perceptions of how students react to their stories. They were asked about whether there were types of stories that they perceived were more effective or had greater impact. Finally, they were asked whether they felt their storytelling had an impact on their relationship with their students, and if so, in what way.

Students were asked about whether their instructor shares personal or other kinds of stories with them in class. They were asked to recall a specific story that they remember and how they felt about the story and the instructor's use of it. Students were asked what kinds of appealing stories instructors might use, and to describe any types or characteristics of stories they felt might have a negative impact.

The CIT has been described as a set of procedures used to collect observations of human behavior (Byrne, 2001). The technique was first used during World War II to collect information about the training needs of pilots. It takes its name from the process of "collecting information about critically important (critical) performance in special situations (incidents)" (Rothwell & Kazanas, 2004, p. 70). According to Jacobs (2019), it is based on the idea that "gathering actual stories about a certain activity that have led to both effective and ineffective outcomes can provide unique insights about that activity in general" (p. 133). All interviews and CIT sessions were recorded and transcribed to text following the session.

Each instructor was given the opportunity to share critical incidents following the initial interview. The CIT used the following prompt to elicit stories from instructors: *Can you think of a time when you've used a personal story during instruction with either positive or negative results? Please tell me about that experience. What*

was the story? What did you intend students to get from the story? Why do you think it was effective or ineffective?

Data Analysis

The process of analyzing data from interviews and CIT sessions followed the recommended process presented by Creswell (2012). This process involved the researcher (a) organizing and preparing the data for analysis, (b) exploring and coding the data, (c) building descriptions and themes, (d) representing the description and themes, (e) interpreting the findings, and (f) validating the accuracy of the findings (Creswell, 2012, pp. 261–262).

Following each interview, the recording was transcribed using transcription software to create a text file for review. Once transcripts were reviewed for accuracy, the researcher used hand coding to organize information. This coding process involved segmenting and labeling text to form descriptions and identify broad themes in the data (Creswell, 2012, p. 243). All themes derived from the coded data were used to develop the final set of guidelines for recommended inclusion in instructor professional development programs. Data collected from the CIT sessions were analyzed after the interview data, using similar coding techniques to identify common themes among stories used by the instructors.

To ensure reliability in the coding process, Creswell and Creswell (2018) recommend cross-checking codes for intercoder agreement. This process involved comparison of independently coded analysis between the primary researcher and another coder to demonstrate consistency in the coding process. Miles and Huberman (1994) recommended that coding be at least 80% in agreement for good qualitative reliability (as cited in Creswell & Creswell, 2018). In this case the cross-check indicated agreement above the 80% threshold.

Findings & Recommendations

This section presents findings from data analysis and is organized around the research questions (RQ) at the center of the study.

RQ 1: What are the experiences of military instructors in using storytelling as an instructional delivery technique?

The first research question addresses the experiences of instructors using storytelling as an instructional technique. The perceptions of their use of stories and the role stories play in their classrooms was documented. Semistructured interviews

verified that all instructors have used stories in their classes in either deliberate (planned) or spontaneous situations, or both. Themes emerging from interviews that illustrate the ways instructors use stories centered on three thematic categories-- the instructor's intent in using the story, the types of stories told, and the method used when employing storytelling.

Instructors were readily able to describe their own intent associated with their own use of stories in their classes, and generally listed similar intentions when including stories in their instruction. They describe incorporating stories to add creative interest to a dry topic or presentation, to emphasize or demonstrate the importance of the topic or learning objective, and to provide a concrete example relevant to the topic for illustrative purposes. Several instructors cited the way a story serves to illustrate their own firsthand knowledge of the topic. One of the most often cited uses of stories among these instructors was the intent for students to learn from someone else's mistake or failure; 13 of the 15 instructors use stories with that intent.

All instructors indicated their primary source of storytelling is personal experience. The two most often cited types of stories were those that described their own mistakes or some failure from their own experience and those that described interpersonal relationships or conflicts from their leadership experience.

RQ2: How do students perceive the role of storytelling in their learning experience?

The second research question explores student perceptions of their instructors' use of stories in the Captains Career Course. Interviews with nine students assigned to different small group leader respondents revealed several themes. Students spoke about the appeal of stories as an instructional technique and offered some insight as to aspects of storytelling that can have negative impacts as well.

The student respondents in the study were generally positive in their opinions about instructors using stories as part of their lessons. All respondents saw stories as a helpful and essential tool for instructors to use in their courses. In general, students expressed appreciation for instructors' personal experience stories, in most cases rating those stories as more valuable than secondhand stories, examples from movies, or historical vignettes. Students described the appeal of realism and credibility provided by instructor stories and the ways a story can elevate their learning from simple knowledge to higher levels of analysis, application, and synthesis. Students described how a story ties the present learning objectives to previous learning, which synthesizes specific learning objectives with other aspects of the curriculum. Several students indicated that the stories instructors tell increase the students' confidence in the instructor's ability to teach on the topic, but more importantly how personal stories help the students connect with the instructor. One student described it this

way: "It feels like they're more invested in the instruction and in you as a person. And then you start to look at them not just as a teacher, but as a mentor as well."

While student respondents generally provided strong support for storytelling as an instructional technique, those interviewed in this study provided some insight as to what types of stories or characteristics of storytelling may have negative results with students. Among student respondents, there was a general sense that stories should relate to the topic of instruction, or to leadership lessons in general.

When describing storytelling behaviors that have a negative impact, students mentioned stories that seemed to be the instructor "gloating," and the stories on sensitive topics might alienate students. They also described how an instructor may tell a story with too rigid of a perspective, presenting the story as "this is the only way" and having fewer positive impacts on their learning. Finally, they warned of instructor self-deprecation as a potential negative as well, requiring a balance to maintain instructor credibility.

RQ3: What characteristics of effective storytelling are reflected in incidents described by experienced instructors in a military training and education context?

When exploring the personal experiences of instructors and students participating in this study, both groups of respondents provided insight into how instructors can tell great stories and use them effectively to achieve educational outcomes. Instructor descriptions of critical incidents in which they have used storytelling in their courses with positive outcomes provided illustration of those insights in practical application.

These incidents underscore principles as described in the instructor and student interviews as well as principles supported by the literature on storytelling and effective instruction. All the instructor respondents in the study provided stories from their own personal experiences as illustrations of effective storytelling. Many used humor, often adding a humorous perspective to a significant failure in their past. Eight of 17 stories described decision-making processes and outcomes, with several instructors describing how they place the student "in" the story to make decisions and compare to the instructor's actual experienced results. A full 11 of 17 effective critical incident descriptions evidenced instructor self-disclosure, wherein the instructor's story described a mistake, shortcoming, or failure with lessons learned.

In considering the training needs of instructors, aspects of the critical incidents linked to narratology can provide insight into the instructors' skill in storytelling. For example, of the 17 incidents provided, most met the structural definitions of a story as defined in the study. To review, a story refers to narratively patterned information with a beginning, middle, and end in which there are events, challenges, or conflicts (plot) and a final resolution of the dramatic tension of the plot. Of note for this study, four of the 17 critical incidents instructors described were missing essential elements of nar-

rative structure. While instructors related experience-based tips, tricks, and recommendations for how to handle a situation, there was often no chronological sequence of events, and no defined beginning and end. These experiential discussions provide insight without a series of events leading to a conclusion with a moral or lesson.

RQ4: How well does current instructor training for new military instructors provide preparation for the use of stories as an instructional technique?

Instructors who participated in this study showed evidence that suggests the existing training provided in the foundational instructor training course yields little in the "how-to" aspects of storytelling. A review of the curriculum in the Common Faculty Development Instructor Course, or CFDIC, supports that conclusion as well. Additionally, no respondent reported any other professional development program or other training on storytelling as an instructional technique.

All 15 instructors who participated in the study reported no specific training on how to use stories as an instructional technique. Yet without exception, these instructors shared personal experiences as a regular part of their interaction with students and have seen positive impacts from the technique. Many reported that their storytelling is planned and generally with an intended outcome, though nearly all respondents reported spontaneous storytelling that occurs because of a need to clarify an instructional point further or as the result of discussion with students or student questions.

Discussion and Recommendations

Based on instructors' own reporting and the feedback from student respondents, the successful storytelling incidents, and instructors' reported outcomes from them, there are several lessons focusing on three areas: depth and transfer of knowledge, student engagement and knowledge sharing, and the trusting relationship between instructor and student.

A primary goal of training and education programs in professional settings, including professional military education, is the transfer of knowledge gained from the classroom to on-the-job performance. In fact, Gagne (1977) described how "the change in performance is what leads to the conclusion that learning has occurred" (as cited in Devine et al., 2014, p. 5). Adult learning theory, including experiential learning theory (Kolb, 1984), recognizes the importance of experience as a teacher.

Because the role of leaders in the military often places the commander in a decision-making role, a significant portion of the curriculum in leader education involves decision-making. The literature supports stories as a means of presenting choices for the audience to consider. Decision stories in which the main character faces a choice with

multiple practical courses of action for consideration represent a solid use of stories in adult learning (Caminotti & Gray, 2012). Findings in this study indicating students reject stories when the narrator's choices are seen as rigid or "the only way" support this aspect of good storytelling in the classroom. Instructors in the study who used their personal stories and allowed students to provide input at decisive points, and those who used their own stories as the foundation for role play reported successful storytelling experiences. Decision-making stories, then, can support students' ability to practice making decisions and consider alternatives; as a result, they may be more likely to transfer competent decision-making skills from the experience to their next leadership position.

Additional evidence from the study and the literature supports the assertion that storytelling encourages transfer from the classroom to on-the-job performance. Both instructor and student respondents reported that when instructors use stories from their experiences, the level of learning is elevated from simple concept memorization or understanding processes and procedures to a greater ability to apply the learning to novel situations, and to synthesize the material with other topics and in other scenarios. The simple act of using a story to clarify a real-world application opens the scope of the learning objective beyond a list of bullet points or descriptive text from a doctrinal manual. The literature supports this clarity of communication on the part of the instructor to elevate the learning. The literature proposes that the "semantic structures and temporal ordering of information in a story act as an attention-focusing mechanism that aids in inquiry, decision-making, and learning" (Andrews et al., 2009, p. 7). Ensuring instructors are well trained on the presentation of stories with decision points, both in terms of the types of stories that are most effective and the method of telling the story to achieve maximum impact, would benefit training and educational outcomes in military professional education.

Findings from this study indicate that both instructors and students value storytelling for its ability to promote student engagement and knowledge sharing. The primary model for instruction in the Captains Career Course is an experiential learning class structure wherein the instructor acts as facilitator and students share experiences to achieve educational learning objectives. From the literature, Andrews et al. (2009) described this effect as well, noting that in classes where storytelling embeds the learner in "contextual, authentic, real-world problems are more engaged, draw on more resources, and transfer learning more effectively" (p. 17). Both instructors and students in this study point to the credibility-building effect of an instructor's ability to share real-world experiences related to the topic of instruction. When an instructor did not share stories, in fact, students reported they might be skeptical of the instructor's expertise in that subject. As the literature indicates, credibility is a critical factor in the instruction process and in the process of building relationships between the instructor and students (Myers, 2001; Stoltz et al., 2014). Instructors reported that students ask more questions and that the level of discourse in the class in general is elevated when stories are presented. Both students and instructors reported that students were more

likely to share their own personal stories when an instructor does so, leading to a greater sharing of knowledge amongst the students in the small group in general. The effect directly supports an essential characteristic of the experiential learning methods used in the course, encouraging students to share knowledge related to the learning objectives. Training on storytelling, if added to the current professional development for new instructors, could extend instructors' expertise in facilitating experiential learning in their classrooms from the start of their instructor assignment.

The literature on effective learning for adults consistently supports the need for adults to learn in a trusting environment (Cozolino & Sprokay, 2006). A trusting relationship between mentor and learner establishes conditions in the brain for changes in neuronal networks—making the brain ready to accept and integrate new knowledge or skills and activating higher order thinking through those connections. "Learners are assisted in moving their thinking activity into the higher brain regions (the frontal cortex), where reflective activity and abstract thinking take place" (Johnson, 2006, p. 64). Respondents, specifically students in this case, reported that an instructor's willingness to tell stories in which they are portrayed as less than the "hero"—those in which they failed or made a significant mistake—made students think more highly of them and increased their level of trust and willingness to expose their own vulnerabilities as well. Instructors expressed intent to have a classroom where it was safe to share, and both students and instructors reported that to some degree, vulnerability encourages trust. While instructors often focus on the training outcomes of their classes, such as whether students achieve learning objectives or whether they can succeed during performance-based assessments, they may overlook the importance of building the team in the classroom to foster those outcomes. Findings from this study support prior research indicating the relationship between instructor and student (Cozolino & Sprokay, 2006), the connection achieved by sharing stories (Stephens et al., 2010), and the trusting relationship instructors' vulnerability encourages all lead to a greater likelihood that students will be more engaged in the class, ask more questions, and explore concepts more deeply (Andrews et al., 2009). In classes like the Captains Career Course where instructional methods focus on experiential learning, a willingness to share experiences among the students and instructors is critical to the success of the methodology. When students report that their instructors' storytelling makes the instructors more relatable, helps students connect with the instructor, and results in more students sharing stories as well, a natural conclusion would be that ensuring instructors have an adequate understanding of how stories influence and educate is critical.

Recommendations

The purpose of this study was to generate recommendations for instructors' use of storytelling in military training and education courses. The process of identifying

Table 1

Guidelines for the Use of Stories in Professional Military Education

Recommendation	Support: Literature and this study	Guidelines for action
a. Integrate relevant experiential stories in lessons to bolster credibility of the material and the instructor.	Correlation of instructor credibility with student outcomes (Stoltz et al., 2014). Instructor credibility is one of the most important variables in the relationship between instructors and students (Myers, 2001). Stories communicate expertise and transfer information (Bryant & Harris, 2011). It is important to align instructional activities and assessment tasks with objectives, and when instruction is aligned with the objectives, students will need to spend less time learning the objective (Raths, 2002). Stories help establish the instructor's competence with the subject matter. Two thirds of students agreed that personal storytelling enhances an instructor's credibility (Current Study, Research Question 2).	To find relevant stories to use in class, consider the lesson's objective and ask: 1. Is there an incident from my own experience in which I have demonstrated this objective? 2. Have I seen this objective in action? Select and tell stories that are relevant to the learning objective, but don't brag. Select stories with a purpose in mind for the listener. Do not choose and tell stories just to reminisce, vent, or for any other personal reason. If it isn't relevant to the listener, do not tell it. Be specific. It's not interesting to the audience to tell them "I always …." Instead, pick a specific example with specific details and tell that story. You can generalize later.
b. Use self-disclosure stories to establish and build trust between themselves and their students.	Self-disclosure decreases uncertainty and increases communication and positive affect (Aidman & Long, 2017). Learning through others' experiences is effective because it involves no negative consequences (Luria et al., 2019). Self-disclosure in instructional settings results in positive impact on perceptions of the instructor's character, caring, and competence (credibility) (Meluch & Starcher, 2019). Instructor self-disclosure reduces student apprehension (Meluch & Starcher, 2019) and "expressed to students a likeness between the instructor and students" (Solis & Turner, 2016). Narrative self-disclosure increases perceptions of caring & instructor credibility (Cayanus & Martin, 2008). Instructors who disclose relevant and appropriate personal information increase perceptions of caring, credibility, and affinity with students' experiences (Myers et al., 2009). Instructors and students believed that the instructor's willingness to be vulnerable was helpful in developing the relationship between the instructor and student (Current Study, Research Questions 1 & 2).	Consider stories in which you aren't the hero. If you learned a lesson, so will the students. They'd rather learn from your mistakes than make their own. Don't overdo your failure stories. There's a balance between showing vulnerability and maintaining students' faith in your competence. Humor in hindsight is a great way to keep a painful story from bringing the audience too far down. Leave the audience with something positive. Vulnerability encourages trust. Share your "lessons learned" from the incident in the story—whether they are lessons about yourself, your skills, or your knowledge.

Table 1

Guidelines for the Use of Stories in Professional Military Education (continued)

Recommendation	Support: Literature and this study	Guidelines for action
c. Plan, prepare, and practice telling the story prior to integrating into a lesson.	Instructors who use personal narratives to clarify course content are rated more highly compared to counterparts who do not (Downs et al., 1988). Good stories need to be some combination of salient, succinct, funny, emotional, moving, clever, true, short, current, or personal (Harbin & Humphrey, 2010). The storyteller must be comfortable telling the story for the listener to be comfortable with it (Harbin & Humphrey, 2010).	Consider the "so what" of your story. Why are you telling the story? Practice telling the story, alone or to someone else, to get a feel for pacing and details to include. Practice telling your story with enthusiasm, authenticity, and with passion. Playing it safe, being superficial, and using generalizations isn't interesting. Explain why you selected the story. Don't assume the lesson of the story, or the connection between the story and the learning objective, is obvious to students. Practice drawing the audience's attention to the connection to make the story more effective.
d. Include the fundamental components of a story: 1. sequence of events 2. conflict 3. resolution 4. lesson	Building blocks of compelling narratives: challenge, struggle, and resolution (Bowman, 2014) Effective stories have a definite beginning, middle, and end, and listeners must actively engage in the story in an interactive manner (Bryant & Harris, 2011). The best stories are ones in which the main character is facing a choice wherein all the practical courses of actions have both pros and cons (Caminotti & Gray, 2012). Good stories present choices and illustrate the outcome of those choices (McDonald, 2009).	Consider the story in three acts— 1. the first act provides background to the conflict, 2. the second act begins with a turning point in the conflict and ends at the climax, and 3. the third act takes the climax to its resolution and ends with the lesson, moral, or takeaway. Present choices, or multiple courses of action to allow the listener to consider the options as if they are in the story. Take a moment before or at the climax to ask the audience what they would do in that situation?
e. Understand and incorporate a variety of narrative techniques.	Role play enhances episodic memory (Hagen & Park, 2016). Storytelling can function to encourage curiosity, knowledge sharing, & stimulate the process of creating meaning. Stories help develop skills necessary for making decisions (Katuscáková & Katuscák, 2013). Narratives serve to enhance memory through linked associations (Cozolino & Sprokay, 2006). Stories act as "cognitive flight simulators" helping students practice without consequences (Gottschall, 2012). The goal of scenario-based training in the military is "to develop cognitive templates such that military personnel experience as many combinations of battlefield variables as possible while in training" (Andrews et al., 2009, p. 11).	Problem-based instruction uses an ill-structured problem situating the student in the narrative for decision-making. Narrative-based traditional storytelling, the instructor controls the pacing and release of information and context. Tell part of the story, consider the learning opportunities at various stages of the story. If you don't have a personal story, find a story from a peer, a historical case, etc. Get to know the story well enough to create the mental image, to pace it, and to be comfortable telling it as you would your own. One technique is to use a personal experience to walk the students through the scenario. Situate them in the story and let them make choices before continuing with the actual outcomes.

Table 1

Guidelines for the Use of Stories in Professional Military Education (continued)

Recommendation	Support: Literature and this study	Guidelines for action
f. Tell stories deliberately, using details, sensory information, and pacing to optimize the effects of their storytelling.	Instructional storytelling transfers a mental image to the listener – increasing the likelihood of retention (Harbin & Humphrey, 2010). The story people see, hear, and feel is a composite of every aspect" of the teller—visual, auditory, and kinesthetic (Simmons, 2019). Pacing, pauses, even irrelevant details create a sense of anticipation—heightened arousal appropriate for learning (Simmons, 2019).	When telling a personal story, slow down. Reveal key information in small pieces to build suspense. Add details that create a picture with sensory images, even when they don't contribute in a material way to the "plot." This invites the listener into the story. For example, describe the scene, physical and emotional details – let the listener know how you felt at that moment. Consider details that added to the conflict? Mosquitoes biting? Hands so cold they hurt? Nervous or worried about something at home? Use gestures, describe smells, and use sound effects. Describe the other people in the story to make them more real to the listener—even a small detail can add to the effectiveness of the mental image.
g. Consider unique aspects of their audience when telling stories.	Storytelling is a dynamic triangle of telling, listening, and story (McDowell, 2021). Storytellers have the responsibility of respecting and protecting the audience as they travel together through the story (Bryant & Harris, 2011). Students cited sensitive subjects and rigid perspectives as ways instructors' storytelling may do more harm than good (Current Study, Research Question 2).	Consider that each instance of storytelling is different. While a story may not work well with one audience, it may be more relevant to another. It can be helpful to warn the audience if there is sensitive content in the story. Follow the story with an invitation to students to share their own stories – this can extend the effectiveness of the instructional storytelling.
h. Assess the effectiveness of a story after each telling to improve instructional effectiveness	Review of instruction constitutes a formative evaluation with the goal of identifying ways in which the materials are "on target" and ways in which they can be improved (Gagne, Wager, Golas & Keller, 2005). The ability to reflect on personal strengths, weaknesses, and approaches to one's teaching is an important quality of effective educators (Kirpalani, 2017).	Following the use of a story during a block of instruction, an instructor should reflect on the storytelling experience to gauge its effectiveness, or areas for improvement. You may want to ask student(s) their impression of the story 1. What did they liked or not like about the story? 2. Did the story help them understand a concept or some part of the lesson better? 3. Did the story raise any questions? Use student feedback and your own perceptions to improve the story for the next telling. Keep notes on findings with other lesson materials for preparation the next time the class is taught.

these recommendations resulted from pairing findings from the study and corresponding supporting evidence from the literature. The resulting recommendations provide guidelines for instructors and instructional designers on the preparation, development, and implementation of stories in classes. The following criteria were established for the development of these recommendations:

- Each recommendation is grounded in research findings from established literature on adult learning, storytelling, or a combination of both.
- The recommendation provides practical, actionable guidelines for the use of stories, focused on (a) optimizing learning outcomes and (b) strengthening the instructor/student relationship.

Table 1 provides guidelines for instructors, support from research literature for each, and suggestions for practical implementation of each recommendation.

Findings from this study indicate that instructors are using stories in their classrooms with positive outcomes, but they are doing so almost accidentally, and without the benefit of any significant training on how stories can and do impact instruction, the instructor/student interaction, and learning outcomes. Findings might lead one to ask how much better the student experience and outcomes might be if these instructors had the benefit of training targeted at their storytelling skills.

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Upcoming Conferences of Note

June 6–8, 2025: The 2025 Teaching Professor Conference

Washington, DC

https://www.magnapubs.com/teaching-professor-conference/

This conference focuses upon practical, evidence-based tools and practices to help instructors excel in the classroom. The Teaching Professor Conference is your opportunity to dive into effective teaching practices, enhance student learning, and join a supportive community of fellow faculty members who share your same challenges.

June 26–28, 2025: Adult Education Research Conference (AERC)

Montgomery, AL

https://newprairiepress.org/aerc/

AERC is an annual North American conference that provides a forum for adult education researchers to share their experiences and the results of their studies with students, other researchers, and practitioners from around the world.

October 6–10, 2025: American Association for Adult and Continuing Education (AAACE)

Cincinnati, OH

https://www.aaace.org/page/Conference

This is the annual conference of one of the nation's largest organizations for adult and continuing education. AAACE is the publisher of three leading adult education journals: *Adult Education Quarterly*, *Adult Learning*, and the *Journal of Transformative Education*.

October 13–15, 2025: Association for Continuing Higher Education (ACHE)

Milwaukee, WI

https://www.acheinc.org/87th-annual-conference-2025

ACHE is a dynamic network of diverse professionals who are dedicated to promoting excellence in continuing higher education and to sharing their expertise and experience with one another.

January 8–10, 2026: International Teaching Learning Cooperative

San Diego, CA

https://www.lillyconferences-ca.com/

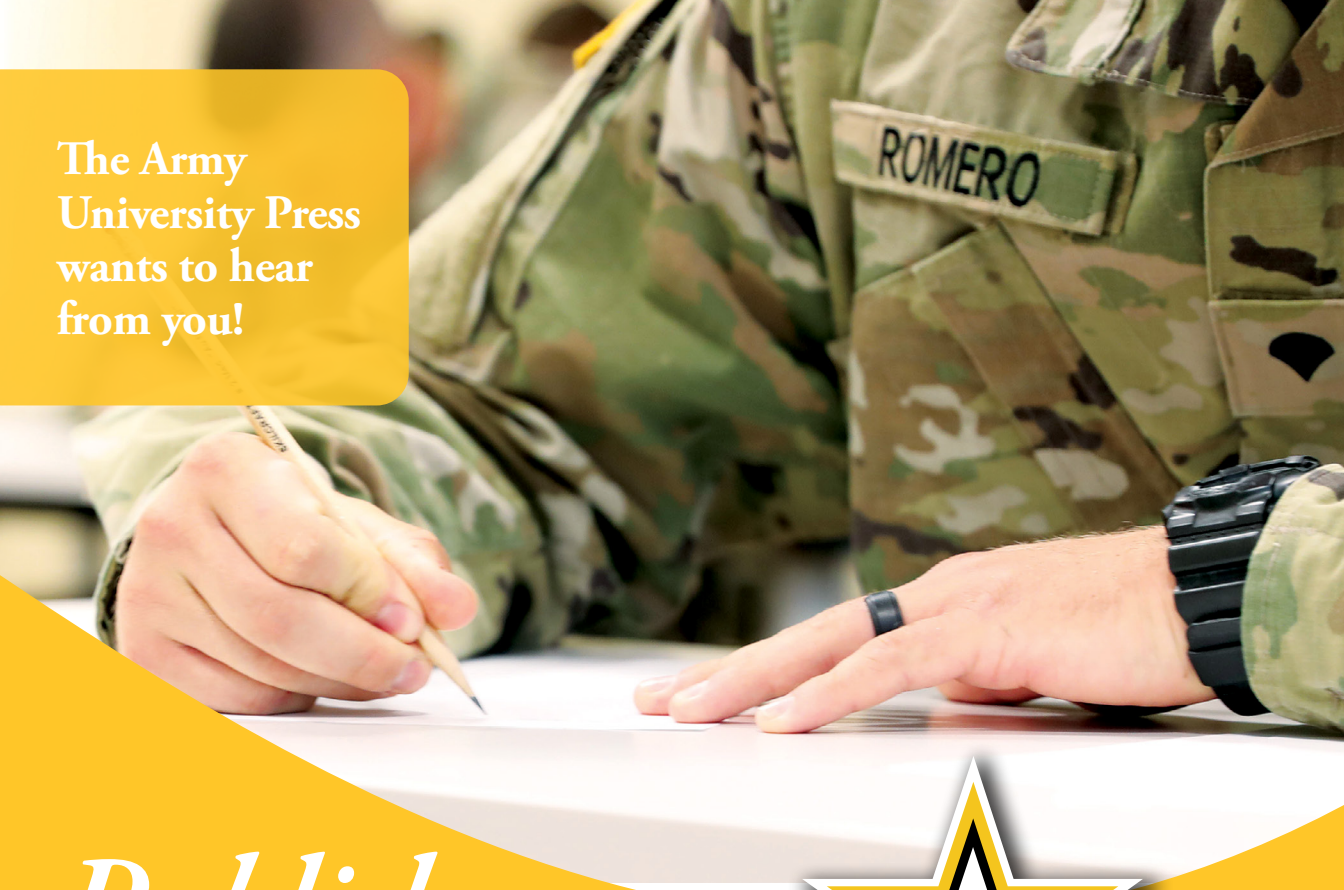
This conference provides opportunities for the presentation of the scholarship of teaching and learning. Faculty and administrators at various stages in their academic careers come from across the United States, representing nearly every discipline found in higher education.

January 11–14, 2026: Future of Education Technology Conference (FETC)

Orlando, FL

https://www.fetc.org/2026

FETC 2026 will host hundreds of sessions across eight distinct tracks that will spark ideas and inspire motivation. Tracks include district, school, classroom, information technology, coach, inclusion, sports, and library leaders.



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