Metacognition and the Military Student

Pedagogical Considerations for Teaching Senior Officers in Professional Military Education

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Abstract

This article explores the role of metacognition as a skill set of and a teaching tool for senior-level military students. The authors offer pedagogical practices they have gleaned from their experiences teaching at U.S. Air Force and U.S. Marine Corps senior-level schools, and they argue that metacognition is a key element in professional military education. The three teaching vignettes provided reflect the metacognitive processes associated with planning, enacting, and evaluating course content and are accompanied by a set of recommendations that can be extended across a range of professional learning contexts.

Senior officers in today's military are highly educated professionals (Parker et al., 2017). Members of the military are situated on a continuous timeline of educational and training requirements, a portion of which are referred to as professional military education (PME). These requirements are designed with attention to adult learning theories and practices, and serve millions of Department of Defense personnel (Persyn & Polson, 2012; Waggener, 2015). For senior officers (field grade O-4 and above), PME offers opportunities for 10-month-long master's degree programs by senior service schools, both in residence and online.

PME for senior officers is intended to develop and refine the habits of mind needed for more advanced leadership positions where they will be asked to think both "jointly" in understanding the roles and relationships among all services, and "strategically" in recognizing "complex ends and long-term effects difficult to plan [for] and foresee" (Bonadonna, 2018, para. 2; see Dempsey, 2012).

Utility of Metacognition for Professional Military Education

Metacognition is the ability to predict and monitor one's own learning (Bransford et al., 2000). More casually, it is often described as "thinking about thinking." This article leverages the authors' more than 25 years of combined experience teaching senior officers to promote pedagogical tools emphasizing metacognition by both students and their teachers as a particularly effective approach to teaching senior officers in a variety of PME in-residence settings.

Metacognitive practices contribute to long-term, lasting learning, according to DePaul University's Center for Teaching and Learning (2019). Teaching praxes

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consistent with metacognitive approaches to learning "include those that focus on sense-making, self-assessment, and reflection on what worked and what needs improving" (Bransford et al., 2000, p. 12), and these activities enable students to better apply and adapt their learning to new tasks and contexts.

This article offers a brief overview of characteristics of senior officers as students, introduces key concepts in metacognition, and makes recommendations for pedagogical practices that emphasize metacognition in a variety of PME settings to capitalize and build on existing metacognitive skills of these students.

Although PME has received attention of late in such national security-focused media as War on the Rocks and the Strategy Bridge, greater emphasis has been placed on the "what" (curricular content and student outcomes) than on the "how" (teaching methodologies and philosophies) (Augier & Hughes, 2019; Bonadonna, 2018; Morgan-Owen, 2018; Venable, 2019; War on the Rocks, n.d.; for exceptions, see Carter, 2010, and Johnson-Freese, 2013). Attention to metacognition in pedagogical practices in PME helps to satisfy the "how" question in this teaching equation.

There are ongoing discussions and debates about the current models of PME, surrounding issues of course content, academic rigor, breadth of topics, and the overall professional needs of its students (Johnson-Freese & Kelley, 2017; Shanks Kaurin, 2017). Arguments include whether PME should offer a broad but shallow overview of relevant disciplines, granting graduates a "wider expertise and flexibility across a range of areas, with an ability to move between both and be competent and lead in different areas" (Shanks Kaurin, 2017, Two Paths section, para. 2) or hold students accountable to academic standards equivalent to civilian graduate-level programs (Murray, 2016). Meanwhile, PME faculty continue to develop "critical and reflective thinkers who broadly view military affairs across an array of academic disciplines" (Chairman of the Joint Chiefs of Staff [CJCS], 2015, p. A-A-1). Therefore, regardless of where a teacher stands on the content, rigor, and program outcomes debates, metacognitive pedagogy benefits the students and their learning outcomes, especially in the effort to build senior military leaders who "possess acuity of mind at the highest level" (CJCS, 2015, p. A-A-1).

Relevant Characteristics of Senior Officers as Students

As students, senior officers bring many positive characteristics to their educational activities. Teachers can assume these students are comfortable with hierarchical relations in professional settings, are focused on mission and goal accomplishment, and "are respectful, follow instructions, and observe deadlines" (Smucny & Stover, 2013, para. 5). Senior officers are adept at responding appropriately to critiques, standards, and expectations in a timely and suitable fashion; they are accustomed to satisfying professional and educational requirements with little to no guidance or oversight. They hold themselves and their peers accountable to standards of integrity, and they are rou-

tinely evaluated on successful attainment of externally imposed goals in their annual performance appraisals. As a result of frequent job changes and their concomitant new performance expectations, senior officers have notable skills in learning and applying new content quickly and effectively in order to successfully fulfill their job duties.

Metacognition: Effects, Elements, and Strategies

Use of the term metacognition (as introduced by Flavell, 1979) in relation to adult educational practices and theories references "higher order thinking which involves active control over the cognitive processes engaged in learning" (Livingston, 2003, p. 2). The two fundamental, and equally important, components of metacognition are *reflection*, or consciously thinking about what we know, and *self-regulation*, or actively managing how we learn (Darling-Hammond et al., 2003). The student owns and manages the practice of his or her own learning through techniques, attitudes, and processes (such as linking new knowledge to existing cognitive frameworks) for their own educational success. Broadly speaking, metacognition encompasses the myriad collection of facts, experiences, processes (or strategies), consequences (or effects), and aspects of self-knowledge that an individual activates in any learning event.

Metacognition research often describes the *effects* of metacognition on students, the *elements* or subcategories of metacognition that make up the larger construct, and the *strategies* that students use when they are metacognitive in their learning practice. The effects, elements, and strategies most relevant to the teaching vignettes in this article are outlined below.

Effects. There are multiple positive effects that come from an individual's metacognitive activity. One significant effect of metacognition discussed in the first teaching vignette is the reduction of confirmation biases as individuals question the origins of their cultural stereotypes and update their knowledge. Such thinking processes have the potential to positively impact the growth of an individual's intercultural effectiveness by promoting *contextualized thinking* and increasing *cognitive flexibility* (Chua et al., 2012; Mor et al., 2013).

Elements. Metacognition does not stand alone from but rather acts as a bridge between cognitive and behavioral aspects of learning, or between critical thinking and learning processes (Kuhn & Dean, 2004). The utility of metacognition to higher-order thinking and social interaction is widely recognized as a means of *linking* abilities: this is what I know (cognitive), this is how I think I should apply what I know (metacognitive), and this is what I do with what I know (behavioral) (Sieck, 2018).

Strategies. Those who are skilled in metacognition monitor their progress as they learn, make changes, and adapt their strategies if they sense they are not doing well. Some strategies that students use, and that teachers can find ways to integrate into courses, include the "think out loud method"; working forward from given informa-

tion to finding unknowns; predicting the difficulty of solving problems; and monitoring their own problem-solving strategies (Bannert & Mengelkamp, 2008; Ku & Ho, 2010; Sternberg, 2001, p. 253).

Metacognition and the Connection to Professional Military Education

The Chairman of the Joint Chiefs of Staff's (2019) *Vision and Guidance for Professional Military Education and Talent Management* emphasizes consistently prioritizing critical and creative thinking, continuous learning, and cross-domain collaboration. In addition to the benefits of metacognition in itself, metacognitive thinking uses skills that support critical thinking such as "the ability to consider the basis of one's own beliefs" and "considering the relationship between one's conceptions and any evidence that might or might not support those conceptions" (Lai, 2011, p. 12).

Metacognition offers an effective means of engaging senior officers in learning, especially in PME settings. PME institutions are specialized professional schools designed to expand senior officers' skills within their existing knowledge base. In that way, PME students do not differ from attorneys, physicians, dentists, and others whose postlicensure education is focused on honing the expertise of a specialized professional identity. Professional schooling is designed to prepare students in part to "think like" whatever professional identity they are working toward (Sullivan et al., 2007, p. 5). Senior-level PME across the services offers varied opportunities to practice critical thinking. Unfortunately, metacognition is often left out of the discussion.

Teaching Vignettes

The U.S. Marine Corps War College (MCWC) and the U.S. Air War College (AWC) are both degree-granting, graduate-level, 10-month long programs. Graduates from both schools will receive a Master of Strategic Studies degree. The Air Force Culture and Language Center (AFCLC), under the leadership of AWC, serves the total Air Force as the center of expertise on culture and cross-cultural competence. As with all senior-level schools, their student populations are comprised of members of that service, international students, civilian leaders from various U.S. agencies, and members of the other branches of service, allowing students access to diverse perspectives.

The teaching vignettes used in this article are drawn from three courses the authors have designed and/or taught and which have been honed over time as recognized by MCWC and AWC. This diversity of teaching settings demonstrates the utility of emphasizing metacognition regardless of the length of the teaching event, the course topic, course objectives, the number of students, or the specific service

school. The first vignette reviews a two-hour introductory seminar for O-5s (lieutenant colonels) and their international and civilian equivalents; the second is a semester-long graduate-level course for O-5s and O-6s (colonels) and their international and civilian equivalents; and the third is an executive-level, three-to-five-day course customized for individual general officers.

Vignette #1: Introducing Metacognition in the Curriculum at the Marine Corps War College

The MCWC in Quantico, Virginia, is considerably smaller than its sister service counterparts with an average attendance of 28 to 30 students per year. The MCWC Metacognition seminar was first offered in 2018. After a successful pilot, the MCWC leadership made the seminar part of the core curriculum, noting its utility for (1) reminding students of the various factors of metacognition (many of which operate outside of awareness) impacting their thought processes and (2) offering an introductory class to prime students for the three subsequent "thinking" classes in the curriculum: critical thinking, systems thinking, and creative thinking. The seminar is now delivered the first week of the academic year and lasts approximately two hours. It has three educational objectives that will be reviewed along with the supporting readings for each.

Assess value of metacognition. The first objective asks students to assess the value of metacognition. The class discussion and accompanying readings argue that metacognitive practices help students become more aware of their strengths and weaknesses as students and leaders. Such practices can be elicited by questions such as the following:

● How do you react when you realize your assumptions about [fill in the blank] are inaccurate?
● How has your thinking about [fill in the blank] changed over time?

The "Thinking About Thought" section from Nisbett's (2015) book *Mindware* offers students insights on foundational concepts such as schema, construal, and framing in addition to covering attribution errors, hindsight bias, and spreading activation, which can influence an individual's decision-making processes.

Predict outcomes. The second objective asks the students to predict the potential outcomes associated with the absence of metacognitive involvement. For example, students are asked questions such as the following:

● Can you recall a time when you were keenly aware of the extent of your ignorance?
● Which frames of reference had to change for you to come to this realization?
● Can you walk us through your logic as this realization unfolded?

Conveying the utility of being aware of a student's own thought processes (especially those that they come to recognize as flawed) requires teachers to emphasize the professional value of this type of insight**.** To support this learning objective, students are asked to read the article "Why People Fail to Recognize Their Own Incompetence," which

describes how in many cases, across varied contexts, a little knowledge can lead to a lot of overconfidence (Dunning et al., 2003). The article offers some explanation as to how the absence of metacognition can lead to inaccurate self-impressions and paves the way for reexamining the kind of critical and creative thinking skills (characterizing critical thinking as evaluative and creative thinking as exploratory and generative) that will be required of students as the future leaders of the U.S. Marine Corps.

Evaluate interaction. The third educational objective asks students to evaluate an intercultural context in which metacognition affected the outcome of the interaction. They further evaluate the skills, attributes, and behaviors with respect to metacognition needed to lead in a dynamic joint, interagency, intergovernmental, and multinational strategic environment. The assigned excerpt from Sieck's (2018) *Metacognition in Intercultural Communication* discusses the importance of cultural values as sources of potential friction for leaders and offers some metacognitive strategies to practice when an intercultural interaction is not going as planned. Schein's (2017) "The Change Leader as Learner" chapter is used to help students examine the leader's role in organizational culture and for "the ability to generate new responses … [and] to accept errors and failures as learning opportunities" (p. 345), thus aligning with the CJCS (2019) guidance devoted to continuous learning.

Students are expected to offer critical evaluative comments in seminar discussions that clearly demonstrate their capacity to question their own assumptions and practice reflective skepticism in order to better understand and frame issues, challenges, and problems. Students are assessed—through their class contributions in the dialogue and through showing connections to the required readings—about their understanding of metacognition and its applicability to strategic thought.

Recommendations for Applying in Other Contexts

1. Teachers should remember that they are not only teaching content about metacognition but also applying metacognitive instructional strategies to teaching such content. This can be achieved by articulating their thought processes as often as possible (e.g., use the opening minutes of seminar to walk students through the logic of *why* this course, these readings, those discussion questions, etc.) so as to enact the kind of self-awareness the course advocates. Teachers should also make explicit that while some of this content may seem self-evident (a) just because it is common sense does not mean it is common practice; (b) students cannot know exactly what lays ahead for them in their career, hence the "preparation for the unknown" aspect of education; and (c) there is *always* room for improvement, as CJCS (2019) notes in its verbiage about continuous learning.

2. To avoid too much abstraction in a discussion about metacognition, the teacher should offer opportunities for students to practice recognizing cognitive shortcuts

and biases in a specific context. For example, assign a short but relatively controversial article (e.g., President Donald Trump's pardoning of a Navy SEAL's war crimes) for students to read in advance. Once in class, display some of the more extreme reader comments for students to examine. This helps them become more comfortable recognizing and labeling biased and/or flawed thinking.

3. Recognizing that metacognition might, at the outset, seem to be primarily advocated for by civilian academics, the teacher should provide examples of what higher ranking (higher than the students) military leaders have to say about the value of metacognition. See, for example, Gen. John Kelly's personal example from *The Leader's Bookshelf*, detailing how thinking can and should be systematically cultivated (Stravidis, 2017).

4. Although it is not feasible for all PME programs to include metacognition as a stand-alone seminar topic, there are ways to integrate a deliberate discussion devoted to "thinking about thinking" in the kinds of leadership, communication, and critical thinking classes more commonly taught across the PME spectrum. Provide a one-page handout at the beginning of the academic year with recommended readings (see, e.g., Nisbett, 2015; or Sieck, 2018), common barriers (e.g., cognitive biases and heuristics), and recommendations that could be applied regardless of the seminar topic.

Vignette #2: Metacognition in Classroom Teaching Practices

The second vignette involves an intercultural communication graduate-level, semester-long, elective course offered to students at the U.S. Air War College, a 10-month school at Air University, located at Maxwell Air Force Base, Alabama. The course meets for 10 three-hour seminars over 10 weeks, with each lesson featuring a blend of guided discussions and exercises that help connect the major lesson themes to real-world applications. The two elements of metacognition: reflection, or consciously thinking about what students know, and self-regulation, or actively managing how students learn, are modeled in the three course activities below (Darling-Hammond et al., 2003).

Goal setting. At the initial class meeting, students are asked to reflect upon and write their learning goals for the course, addressing questions such as the following:

*   Why did you choose this course?
*   Why do you find the subject matter interesting/important?
*   What experiences have prompted your interest in this subject area?
*   What outcomes do you hope to gain?
*   What does "successful completion" involve for you?
*   How might you go about achieving your goals (i.e., what learning strategies you may employ)?

This activity follows Lang's (2019) recommendation in encouraging students' metacognitive consideration of the learning strategies they will need to successfully complete the course and the kinds of support they may need to enact these strategies from the very first day of class. Moreover, the practice engages the personal autonomy of self-directed learning, in which students take "control of the goals and purposes of learning and assuming ownership of learning" (Candy, 1991; Knowles et al., 2015, p. 171).

As a way of encouraging students to consider how they are progressing and as a means of determining if adjustments by students and/or teacher are needed, the students are asked at the course midpoint to recall their original course goals with questions such as the following:

● Have your goals changed or are they the same as when you began?
● What progress are you making toward them?
● Are adjustments needed to strengthen your progress?

This practice requires that students "actively monitor their learning strategies and resources" (Bransford et al., 2000, p. 67) and employ corrective action as needed, thus fulfilling the metacognitive "monitoring or self-regulatory purpose" (Sieck, 2018, p. 3) affecting the "executive control processes of planning, monitoring, adjusting, and reflecting" (p. 3).

Lang (2019) advocates an end-of-course practice that helps students connect back to their first day of class and consider their learning progress since then. Accordingly, during the final class session, students again review their "course goals" and reflect on whether their goals have been met, the most important things they have learned, and how they anticipate the ways in which this knowledge will aid them in their future roles. Additionally, students are asked questions such as

● How can you continue to develop intercultural mindsets and skill sets in formal and informal ways?
● How and why do you believe this will be beneficial?

These kinds of questions can help students actively envision how they might apply their new knowledge to different tasks and contexts, a key outcome of metacognitive activity (Bransford et al., 2000).

Decision-making. A second metacognitive strategy is to provide students with the opportunity to make choices about prescribed readings, course activities, and discussions in ways that best support their own interests and goals. These decision-making strategies can take several different forms within classroom activities, such as allowing students to choose the optional course readings most relevant to their goals; or the teacher soliciting students' input on when they would benefit from changing topics versus participating in activities designed to help them apply some element of the lesson. This decision-making is a deliberate way to engage students' metacognitive processes in considering what will best facilitate their learning.

Leading class. By the end of the semester, as the students have become comfortable with the previously described goal setting and decision-making within the course,

they are required to conduct a key lesson themselves, deciding topics, structure, and leadership while the teacher observes. They are given a variety of resources to choose from in planning and executing the lesson, with the requirement that its main themes be addressed in multiple ways (e.g., via discussion, group activity, etc.). To successfully complete the assignment, students must consider the goals of the lesson, decide as a group what strategies will help them best achieve those goals, and consider how well the strategies are working throughout the class session. Thus, students engage the monitoring function of metacognition that involves planning approaches to tasks, paying close attention to activities, and checking outcomes against goals (Brown et al., 1983).

Recommendations for Applying in Other Contexts

1. The teacher should encourage students to engage in goal setting and in monitoring their progress toward their self-defined goals while evaluating how well their learning strategies are working.
2. The teacher should empower students to make decisions about what knowledge is most relevant to them (through reading choices) and about in-class strategies that will best support achievement of their learning goals (through opportunities to choose among discussions and/or exercises).
3. At the end of the course, the teacher should invite students to revisit their goals and reflect on what they have learned in order to help students anticipate and consider how their newfound knowledge might usefully transfer to different contexts.

Vignette #3: Metacognition through Repeated Self-Assessment of Goals

The following teaching vignette examines the General Officer Pre-Deployment Acculturation Course (GOPAC), designed and taught by the AFCLC on-site at Air University's campus on Maxwell Air Force Base, Alabama. This course is an individualized, voluntary, ungraded executive education and training seminar offered to Air Force general officers who are selected for key command positions overseas. The course covers specialized topics that are taught in one- to three-hour blocks over three and a half days.

GOPAC prepares general officers for complex cultural and political settings and grew out of a request by the commander of the International Security Assistance Force that "the Air Force Chief of Staff ensure Air Force senior leaders receive thorough preparation in language and culture prior to deployment" (Air Force Culture and Language Center [AFCLC], 2009). The course has been taught with varying

lengths and content for more than 50 students and has been consistently refined since its inception in the fall of 2009. Even with the significant time and training requirements expected of deploying general officers, GOPAC gained such traction through powerful word-of-mouth that it has grown exponentially from its early incarnations. A typical student response was made by an Air Force major general alum: "Every graduate that I have spoken to made sure to tell me not to miss this course and its amazing training" (AFCLC, 2018).

GOPAC is rigorously tailored for the individual general officer who is typically the only student in the classroom. The course is focused on the location of his or her assignment, the specifics of his or her job, and the exact time frame in which he or she is operating. No two GOPAC courses are the same, even between individuals taking over a command position from a previous GOPAC alumnus.

Offer choices in subject and teaching style. GOPAC has evolved significantly since its initial offerings to ensure content is most useful and relevant to the students' needs. These refinements include a practice first proposed in 2014, but only implemented in the past year and a half, in which incoming students are offered a "deli menu" of course content options. These options are based on topics that faculty, subject-matter experts, outgoing incumbent general officers, and the incoming students all deem relevant and significant. Incoming students, all of whom are highly experienced professionals, are metacognitively skilled enough to recognize areas where their knowledge scaffolding might need additional supports.

Ongoing student self-assessment of learning. Because the course structure includes multiple steps of student self-assessment, students are encouraged to think metacognitively prior to, throughout, and after the course. The precourse design process utilizes a combination of practices that require incoming students to think metacognitively about their own current knowledge base (reflection) and plan learning strategies (self-regulation), while also making the students aware of the metacognitive teaching practices that the faculty lead is employing (Tanner, 2012).

Prior to attending GOPAC, and in addition to the course's mandatory topics, students are asked a series of questions about their goals for the course and the content that they wish to see covered. The types of questions that can be asked of senior-level leaders include

- Are there particular topics that you feel you need to know more about?
- Are there particular teaching styles that are most effective for your learning?
- What topics do you feel confident that you already know well?

The students are informed that their feedback will be used by the AFCLC GOPAC faculty lead and teaching team to design the individualized course.

A daily practice of midcourse assessment is again predicated on the assumption that these students can effectively assess their own learning successes or weaknesses. Students are asked at the end of each class day several questions about the course content, course structure, and their own learning. Examples of effective questions include the following:

- Was the format of today's lessons conducive to achieving your learning objectives?
- Was today's course content at the appropriate educational level?
- Were there any topics that you feel needed more or less teaching time?

Students are asked to be candid, and they offer their feedback in a private setting. Student feedback throughout the course supports teacher metacognition as well and requires teachers to reflect on their own practices and adjust accordingly (Tanner, 2012).

Use alumni reflection to shape future course iterations. The last stage of GOPAC assessment occurs when the general officer alumni are asked to reflect on their learning in the course after having spent six months in their deployment. They are encouraged to offer suggestions or recommendations for changes to the course, as filtered through their lived understanding of their current position. Examples of effective questions at this stage include the following:

- Which parts of the course contributed most to your learning?
- What impact has this course had on you and your ability to perform your job?
- What topics should be included in future iterations of the course?

General officers at GOPAC share many of the cognitive and behavioral attributes of military students described earlier in this article, as well as distinctive characteristics befitting their advanced rank and unique professional positions. They can adapt quickly to new cognitive challenges and often have extensive operational experience, having been deployed to international settings and combat zones. They can recognize the limitations in their own thinking because "[s]trategic thought involves and often demands a multiplicity of voices, of competing concerns and outlooks" (Bonadonna, 2018, para. 5). While this distinguishes the GOPAC students and enables the AFCLC to design a highly tailored educational program, the teaching practices described here are applicable to other settings and students as well.

Recommendations for Applying in Other Contexts

1. The teacher should continually assess the course through the lens of the student, his or her educational goals, and how the student perceives his or her own learning needs. In this process, make certain that the student realizes that self-assessment is not a "gotcha"; rather, it is an effort to best design a course that suits the senior leader's needs.
2. The course should be structured so students have mechanisms to give continual and honest feedback on what content and processes are working best for their learning. For an intensive, multiday course, the teacher can schedule this step at the end of the day while that day's classroom experiences are still fresh. This allows the teacher time to make responsive changes to the course.
3. Build agility into the course, whether that means to leave open blocks of time in the schedule for additional topics or the willingness to drop a topic if it

is not viable for the student. Agility allows for course corrections, both minor and significant, to best meet student needs. This is an intensive process but foundational to providing a truly tailored course. Agility becomes a goal, rather than a distraction.

4. Utilize the metacognitive skills of alumni to help shape future iterations of the course as well. Alumni feedback benefits the teacher as well, as the student and teacher reflect on the aspects of the course with the most utility for the student. Seek feedback at several stages from course alumni about how their learning experience and the course content align with their current knowledge base. Specifically ask what course content was most useful and/or relevant to their jobs and request suggestions for additional course topics for future GOPAC attendees for that position.

Conclusion

The authors of this article have described multiple types of teaching/learning contexts in which pedagogical practices attuned to student metacognition in learning and course design utilizing a metacognitive approach to teaching can benefit senior officers in a PME setting. These practices utilize the strong metacognitive skills of senior leader students in PME.

The vignettes and accompanying recommendations about metacognition and pedagogy are offered in the hopes that they may be usefully adapted to different instructional contexts within PME as an effective means of engaging senior military students in "thinking about thinking." ☙

Disclaimer: Opinions, conclusions, and recommendations expressed or implied within are solely those of the author(s) and do not necessarily represent the views of the Air University, the U.S. Air Force, the Department of Defense, or any other U.S. government agency.

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