Where Army Culture and Twenty-First-Century Educational Best Practices Collide

A Postmortem Review of Distributed Learning Prerequisites in the U.S. Army Captains Career Course

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Educational traditionalists, reformers, and technologists have debated the value of nonresident instruction since the adoption of self-paced correspondence courses in which students received materials through parcel post and completed assignments on their own time.[1] In fact, the expansion of distance learning throughout adult education has roots in the military's innovative approach during and after World War II to provide morale-promoting off-duty correspondence courses to military members deployed around the globe—even to prisoners of war.[2] While the correspondence courses of the past proved effective and well received by students, nonresident instruction in U.S. Army culture has traditionally been framed as inferior to resident instruction.[3] This article uses the case of the Captains Career Course (CCC) modernization effort to examine the enduring tension between the Army's desire to rapidly leverage existing and emerging

Students enrolled in the Captains Career Course participate in a seventy-two-hour simulated natural disaster field training exercise (FTX) at Camp Bullis, Texas, 7 May 2019. The FTX had been added to the course as part of a marked effort to increase academic and tactical rigor in the program of instruction. (Photo by Jose Rodriguez, U.S. Army Medical Center of Excellence)

educational technologies and the difficulty in changing deeply rooted Army cultural perspectives that undermine educational modernization.

Recent advancements in learning science show that the traditional model of classroom-only learning is insufficient to meet the education needs of the modern world. In today's increasingly challenging and rapidly changing military operational environment, learning must be ubiquitous, spanning the full spectrum of formal, informal, and experiential training, education, and development throughout the service member's career.[4] To meet this demand, greater emphasis has been placed on augmenting the episodic institutional education of service members with supporting or reinforcing operational and self-development learning opportunities, including well-designed and engaging distributed learning (DL) courses. Nevertheless, resistance to these initiatives endures.

Even in the face of rapid growth in online military education in the last decade, the military training and education community continues to debate the value of DL, particularly for online mandatory training and professional military education (PME).[5] Common arguments against DL are that students do not learn as much on their own when compared to having an instructor in the loop to facilitate; students do not take the learning seriously and just "click through" the content; and students do not retain enough of the material without having time to discuss with peers in a classroom environment. The chief of staff of the Army similarly expressed concern regarding the value of DL requirements that do not focus on lethality and warfighting.[6]

In response to the chief of staff of the Army's concerns, the U.S. Army Training and Doctrine Command, along with the Combined Arms Center,

conducted a review of all DL prerequisite (DL-P) requirements across PME. After deliberation, the U.S. Army directed the elimination DL-P across a range of courses by 1 October 2024.[7] These courses include but are not limited to all noncommissioned officer education system courses, the Command and General Staff College, and the Captains Career Course Common Core (C5DL) for active-duty captains. The elimination of DL-P across the enterprise indicates that there are both cultural and logistical barriers to the successful integration of asynchronous DL into the Army's learning culture, particularly for the active component.

Despite the removal of DL-P for service members across the Army learning enterprise, online learning in the broader educational community has wide and growing popularity. The growth of online learning is in part due to the flexibility and convenience it offers compared to a traditional classroom.[8] If a course is asynchronously designed, an online student can view the content at a time that fits their busy schedule—they can learn when their time allows or when they determine it is most conducive. Learners can also engage with content from any location that has internet access rather than having to go to a physical location and sit in a brick-and-mortar classroom at a prescribed time.

With a smartphone and internet access, learners can take themselves from almost no knowledge of a topic or task all the way to the application level of Bloom's taxonomy with no classroom, no peer discussion, and no instructor in the loop. Many people would argue that learners appreciate and even prefer the opportunity to fix their leaking faucets, repair their vehicles, and do other types of general maintenance on property and equipment this way rather than going to a class to learn how to do it, find someone else they know to show them, or pay an expert. Although this on-demand and self-directed approach to learning has become pervasive over the last two decades, views of formal learning may be slower to change; many of these same people who learn new skills through their phone or laptop will nonetheless still profess they prefer to "learn" in person.

As learners increasingly employ self-guided, technology-enabled methods in informal settings, an

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important question is how to employ these technologies to support successful asynchronous DL in formal education. Creating quality asynchronous DL has the potential to provide beneficial stand-alone education but can be particularly successful as an enabling tool to support and supplement face-to-face learning. Utilizing multiple modalities leverages the latest advances in technology and learning science to reach audiences with the widest range of learning preferences and accessibility requirements. More broadly, developing engaging DL content and establishing a cultural expectation for asynchronous DL is an important step to provide rapid and flexible responses to operational and environmental constraints such as those posed by COVID-19.

This article highlights the unique experience of both introducing a new DL-P into the modernized CCC and its subsequent removal.[9] Broadly, we ask (1) whether introducing DL-P was effective and (2) what factors may have led to the removal of C5DL prerequisites (C5DL-P). The CCC program evaluation plan has enabled the review and validation of the effectiveness of the CCC modernization initiative and provides insight regarding the future path of Army distributed learning. One year after implementing asynchronous DL-P for the CCC, a comprehensive program evaluation showed improved learning outcomes for junior officers and favorable perceptions by most participants. The results of this preliminary analysis suggest that asynchronous DL as a prerequisite in PME improved learning for military learners, and that external factors relating to implementation and integration may have contributed to the removal of DL-P in the CCC.

CCC Modernization

U.S. Army Training and Doctrine Command Campaign Plan 3.0 Task 3.2 directed modernization within PME to capitalize on the latest technology, modes of instruction, and superior faculty to provide curriculum design with tailorable (online, classroom, blended) options.[10] In December 2020, the commanding general of the Combined Arms Center directed the Army University to lead the effort to create a modernized CCC in fiscal year (FY) 2023 that would produce a captain better prepared to meet the current and future challenges of the multidomain operational environment. In July 2022, HQDA EXORD 267-22,

"ISO Captains Career Course (CCC) Modernization," directed CCC modernization no later than FY 2024.[11] A key component of the CCC modernization initiative was the addition of foundational and reinforcing DL lessons to create a more effective, efficient, flexible, and tailorable educational course and to better align curriculum along the four new command-directed CCC learning areas: (1) Army profession and leadership, (2) staff/branch warfighting functions, (3) command and warfighting, and (4) installation-level focused command topics.

More than seventy course managers and developers from across the CCC schools collaborated through monthly operational planning team meetings in the spring and summer of 2021 to conduct a comprehensive review of common core curriculum, refine critical learning requirements, and identify appropriate modalities to achieve the learning outcomes. These operational planning teams also helped illuminate potential challenges impacting the implementation of the new course design. As a result of this comprehensive review, the common core curriculum was reduced from its previous 240 face-to-face hours of instruction to a total of 147.5 hours.

Importantly, roughly half of the common core (seventy-five hours) would be provided to the learner as asynchronous DL. The introduction of the seventy-five-hour DL-P phrase was only novel for the active component of the U.S. Army. U.S. Army Reserve and Army National Guard officers prior to the modernization effort already had a seventy-five-hour asynchronous DL-P component as part of their thirteen-month CCC model. By aligning the active and reserve component C5DL-P, Army University would ensure equivalency across all Army components.

The intent of the C5DL-P to the resident CCC was to provide each learner an opportunity to achieve a baseline level of knowledge on the fundamental doctrinal concepts that are covered by the CCC common core curriculum. With the foundational knowledge supplied during the DL-P phase, schools could dig deeper and broader into the concepts they deemed most appropriate for their branch-specific officers. The C5DL design also directly supported the learning environment envisioned by the Army capstone concept to "blend learning distinctions between the institutional Army and the operational Army" as part of an adaptive

and continuous learner-centric approach to create seamless transitions between operational and institutional learning opportunities.[12]

In total, 167.5 hours were reallocated from the common core, enabling expansion of their branch-specific instruction. With C5DL focusing on simpler learning tasks of recall and comprehension, the schools and centers could refocus their resident instruction toward advanced knowledge acquisition and application of the concepts learned in C5DL. The additional time would enable students to complete more "sets and reps" in learning and applying the skills required of captains in their future roles as staff officers and leaders in their units.

The C5DL-P to the resident CCC went live in the Army learning management system on 1 October 2022. All officers enrolled in CCC in FY 2023–24 completed the online course prior to attending resident CCC. Army University research psychologists and training developers collected data throughout the first year of implementation (FY 2023) on the DL experience, with the first cohort of officers completing the modernized course in third quarter FY 2024.

We have evidence from assessment measures on the impact that C5DL has had on student learning, as well as both positive and negative perceptions of DL effectiveness from student and faculty evaluations. Understanding the effects and perception of the C5DL-P will help the Army learning enterprise make evidence-based decisions regarding DL PME prerequisites in the future. The remainder of the document will cover the findings from the data collection effort and conclude with recommendations for the way ahead, both for active-duty PME with no DL-P and for the reserve components who require DL-P in FY 2025 and beyond.

Purpose

This article describes the impact of the CCC modernization effort after its first year of implementation and before the elimination of C5DL-P on 1 October 2024. By asking these questions, the authors begin to ascertain the value of DL as a prerequisite in Army professional military education. We first ask, "How has C5DL impacted common core learning outcomes?" Next, we ask, "What is the perception of C5DL from the force?"

Impact on Learning Outcomes

The intent behind CCC modernization was to increase "learning effectiveness and efficiencies without degradation of training standards."[13] Thus, it makes sense to ask whether the introduction of C5DL increased learning effectiveness or efficiency. Of these two categories, more data exists on effectiveness than efficiency.

Impact on learning efficiency. One reason for moving from a face-to-face to a hybrid format for common core instruction was to provide additional time for the schoolhouses to increase time on branch-specific topics. All schools and centers of excellence have fully implemented the modernized curricula. Prima facie, the DL-P met its objective to free up branch-specific time.

While some schools teach common core material throughout the CCC by design, most teach the common core in the first block of the residential course. Most schools have reduced the time for this block, with some reductions up to 70 percent compared to the "legacy" timetable. How schools used this additional time varies but includes adding lessons, expanding instruction on analytic techniques, or providing time for additional resources like coaching and mentoring. This additional time has also been used to increase the depth of coverage on topics relevant for the common core such as increasing the time for the mission command module, expanding instruction on unit training management, and/or expanding time for military decision-making process (MDMP) sessions.

Impact on learning effectiveness. For this study, learning outcome achievement was used to measure effectiveness. In the C5DL context, there are three measures of performance that determine the extent of what the student learned: pretest scores by lesson, module posttest scores, and end-of-course exam scores (see table 1). We began with an examination of the end-of-course scores, representing the bottom line of whether students achieved their common core learning objectives.

Initial evidence points to a small but statistically significant increase in learning for the entirety of the common core. The researchers compared average end-of-course exam scores from FY 2022 to FY 2023 (prior to and after implementation of C5DL). A Welch's t-test showed a statistically significant difference (t [4,063] = -8.18, $p < 0.01$) between the two means. Post-C5DL implementation scores were 2.2 percent higher (83.7

Table 1. C5DL Measures of Learning Performance

Measure	Unit	Description	Timing	Scale
Pretest of prior knowledge of enabling learning objective	Lesson	Ten-question multiple choice exam	Prior to lesson	0–100 points
Posttest of knowledge of terminal learning objective	Module	Multiple choice exam (number of questions varies by module)	End of each module	0–100 points
Comprehensive posttest of knowledge of all C5 terminal learning objectives	Common core	Fifty-question multiple choice exam	After C5 complete (including resident portions of C5)	0–100 points

(Table by authors; from Individual Student Assessment Plan, Captains Career Course Common Core, FY23)

percent, *n* = 2,600) than pre-implementation scores (81.5 percent, *n* = 10,176).

While preliminary data suggest that the implementation of C5DL did not impair and may have improved learners' knowledge and understanding of the common core, there remain significant limitations. First, C5DL is only designed to achieve learning outcomes at the "remembering" and "understanding" level of Bloom's revised taxonomy.[14] There is less evidence exploring whether completing C5DL has any impacts at the "application" level or above. Another limitation that requires additional research is in the area of "skills decay." Learning gains made at time of completion may be reduced as a result of the gap in time between completion of C5DL and attendance at the resident course. Both these issues could be in part addressed by a future analysis that incorporates the direct measures of effectiveness from the DL instruction (pretests and module exams).

Finally, more data is required to evaluate whether the immediate learning impact to the individual learner transfers to the officer's next unit of assignment. Evidence is needed to shine light as to whether officers are transferring knowledge both in command and on staff at the brigade level and below. In terms of Kirkpatrick's four models of evaluation, more is known about student reactions and immediate learning outcomes, and less about graduates' behavior in operational units (transfer) and organizational results.[15]

Perceptions of C5DL from the Field

While direct evidence of the C5DL's impact on learning is still being collected, a wealth of data on the field's (student and instructor) *perceptions* of C5DL exists. This is primarily due to the thorough program evaluation conducted by Army University's Institutional Research and Assessment Division in concert with the Instructional Design Division and partner schools and centers of excellence. The results of this evaluation brought to light many of the instructors' and students' reactions to and perceptions of the modernization effort. Thus far, students have provided their feedback to C5DL in short surveys at the end of each of five modules, with over 8,400 datasets collected. See table 2 for an overview of the topics covered in each module as well as those asked in the first module only, and general questions asked following the final module that covered the whole DL experience.

The results of this evaluation suggested that in general, C5DL provided a quality educational experience: students gave positive or neutral responses across the modules in response to questions about organization (83–92 percent), level of challenge (62–92 percent), and whether they had needed resources (90 percent overall). Moreover, survey responses indicate unique features of the C5DL that benefit students. Seventy percent of respondents indicated they could relate their DL learning to current duties, suggesting a unique opportunity to link learning to ongoing real-world

Table 2. DL Survey Topics by Module

Topic	First Module Only	All Modules	Final Module Only
Previous DL experience	X		
Time taken for module		X	
Organization and navigation		X	
Level of challenge and engagement		X	
Design and use of multimedia		X	
Time management and role conflict		X	
Need for instructor or peer support		X	
Technical issues		X	
Relating DL to current duties			X
General resources needed			X
General effectiveness			X

(Table by Meredith Shafto, Shanda Lauer, and Steven A. Petersen, "Evaluation of the Captains Career Course Common Core Modernization Quarterly Report FY23 Q1-FY24 Q1" [Fort Leavenworth, KS: Army University, 2024])

responsibilities. Table 3 provides examples given by the students of how they have related their learning to ongoing duties and highlights topics including MDMP, planning, training, and general leader development.

Additionally, students were invited to endorse positive features of DL. As shown in figure 1, the top-rated positive aspects concur with the features that underpin the popular use of DL in both civilian and military contexts, including convenience, flexibility, and ability to review instructional materials. Students also indicated that DL-specific aspects of the content design supported learning as intended (see figure 2), with positive or neutral responses across the modules for the effectiveness of multimedia (76–89 percent), interactivity (78–88 percent), and visual design (84–91 percent).

However, the results also indicated that many students had difficulty completing the DL instruction, an issue that differentially impacted active-duty students. All components reported a similar level of "conflict" for completing DL (Active Component [AC], 52 percent; Reserve Component [RC], 48 percent) and identified "Reduced interference from professional or home life" as one of the top issues to address in future iterations of C5DL. However, the AC students were less likely to agree that they could manage their time well to do DL (52 percent for AC compared to 71 percent for

RC). Moreover, individuals with lower ratings for time management ability also gave lower ratings for DL effectiveness and other general evaluation measures. Taken together, these results suggest important contextual and cultural factors that relate to the perceived effectiveness of DL and may have a greater impact on active-duty students.

Some of the feedback provided by students directly motivated improvements to the C5DL. For example, respondents provided examples of technical problems, difficulties they had with a specific aspect of the content, or challenges they experienced completing the online content. However, some of the feedback was both more abstract and subjective, such as the level of engagement students felt or how much they believed the interactivity of the DL format supported their learning. This type of feedback is informative, but it is important to interpret findings in the context of more objective measures and ideally, to identify where evaluative feedback can be directly related to objective measures.

Discussion and Recommendations

Preliminary findings from both direct measures of C5DL testing performance and program evaluation efforts suggest two things. First, the implementation of

Table 3. Examples of Relating DL Topics to Current Duties

Examples taken from C5 Evaluation Dataset, May 2023

Major topics mentioned when relating DL content to current duties			
MDMP	Planning	Training	General
The steps of the MDMP process were helpful for my current duty responsibilities.	*I am my battalion's planner; this module showed how I can more properly plan in accordance with Army methodology.*	*It is directly applicable to dealing with scheduled training events and how we can improve the process. The course content provides a nice backdrop to becoming not only a commander, but an effective staff officer.*	*As a unit commander, who was untrained, this training was useful in almost every area.*
The operations process, MDMP, and IPB courses gave me a much clearer picture of what was going on when I was on staff. I feel better prepared now to serve on staff in the future.	*It helped me understand the thought processes utilized with major staff planning events.*	*I applied the common core knowledge by having discussions with fellow staff members on their experiences in different assignments and how the units executed training.*	*I have already completed command time and all of the coursework was relevant to that.*

(Table by authors)

C5DL was associated with an improvement in common core learning outcomes for U.S. Army captains. Second, a substantial majority of U.S. Army captains perceive value in completing C5DL-P. However, these two findings do little to explain the small but vocal opposition against DL-P and C5DL-P.[16] In this section we consider additional aspects of the C5DL evaluation that provide us with recommendations for improvement.

Tailoring instruction. The gap between the respondents who found value in DL and those who did not could be partially explained by the lack of individualization of the instructional materials. This results in uneven effects: some officers benefit, some officers find the materials too difficult, and some officers find it tedious. Evidence of this fact can be seen in the range of responses to perceptions of the value of C5DL. When asked what their perceptions were for any topic covered in the data collection effort, students provided no "unanimous" response to any topics (see figure 2).
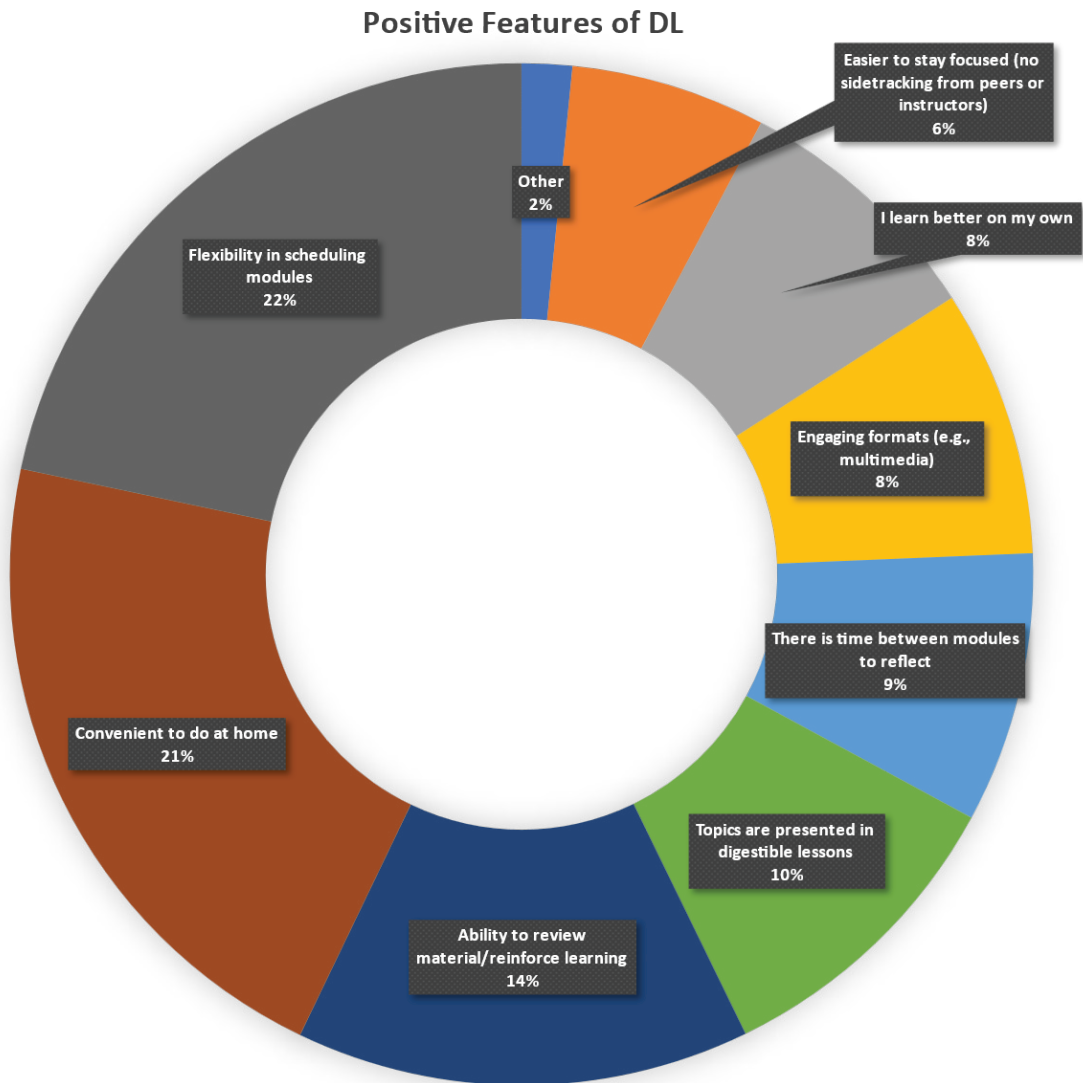
This is evidence that learning is an individual sport. Education, regardless of the mode of delivery, requires active involvement of the individual in the learning process. Individuals determine what and how much they learn through their interaction with or without an instructor. In the case of DL, active involvement consists of the learner's interaction with interactive multimedia

instruction that is presented in the same manner to every officer regardless of their current abilities. This does not allow each officer's learning experience to be in their own zone of proximal development.[17]

Since officers' needs and preferences—time, modality, location, and methods—for learning are not universal, it makes sense to explore tailored learning solutions. This is more than just providing a "test out" option for students in the learning management system. Intelligent tutoring systems such as the generalized intelligent framework for tutoring exist to allow for adaptive and tailored learning experiences for each student.[18] Future modernization efforts can explore ways to incorporate adaptive learning systems to provide a modernized learning ecosystem that best meets each officer's individual learning requirements.[19]

Leveraging DL design and technology. Feedback from the C5 program evaluation indicates that optimizing the use of technology in DL design is not a matter of "all or nothing" or "more is better." For example, the use of multimedia is an important feature of DL but carries risk; the mission command module was rated highest on many aspects of design, and in open-text responses, multimedia was the top theme for positive aspects of the teaching materials for this module. However, videos were also one of the top

Positive Features of DL

Easier to stay focused (no sidetracking from peers or instructors) 6%

I learn better on my own 8%

Engaging formats (e.g., multimedia) 8%

There is time between modules to reflect 9%

Topics are presented in digestible lessons 10%

Ability to review material/reinforce learning 14%

Convenient to do at home 21%

Flexibility in scheduling modules 22%

Other 2%

(Figure by Meredith Shafto, Shanda Lauer, and Steven A. Petersen, "Evaluation of the Captains Career Course Common Core Modernization Quarterly Report FY23 Q1 - FY24 Q1" [Fort Leavenworth, KS: Army University, 2024])

Figure 1. Positive Features of DL

themes for negative ratings and comments on teaching materials, in large part due to the increased technological demands.

Similarly, while technical problems were overall low in the mission command module, for people who had a technical issue, a high proportion of follow-up responses mention multimedia problems (27 percent) or freezing or crashing (40 percent). More broadly, while technical problems were only experienced by a minority, having technical problems was associated with poorer ratings on other aspects of the DL experiences; this link highlights the importance of balancing multimedia demands to achieve a technically successful DL experience, because problems can affect the overall quality of the educational experience and, consequently, evaluations.

Likewise, specific design elements were not universally evaluated as "good" or "bad." For example, when providing open-text responses to the teaching materials, students mentioned enjoying interactive exercises or checks on learning. However, "more" interactivity was not better, and students did not like having
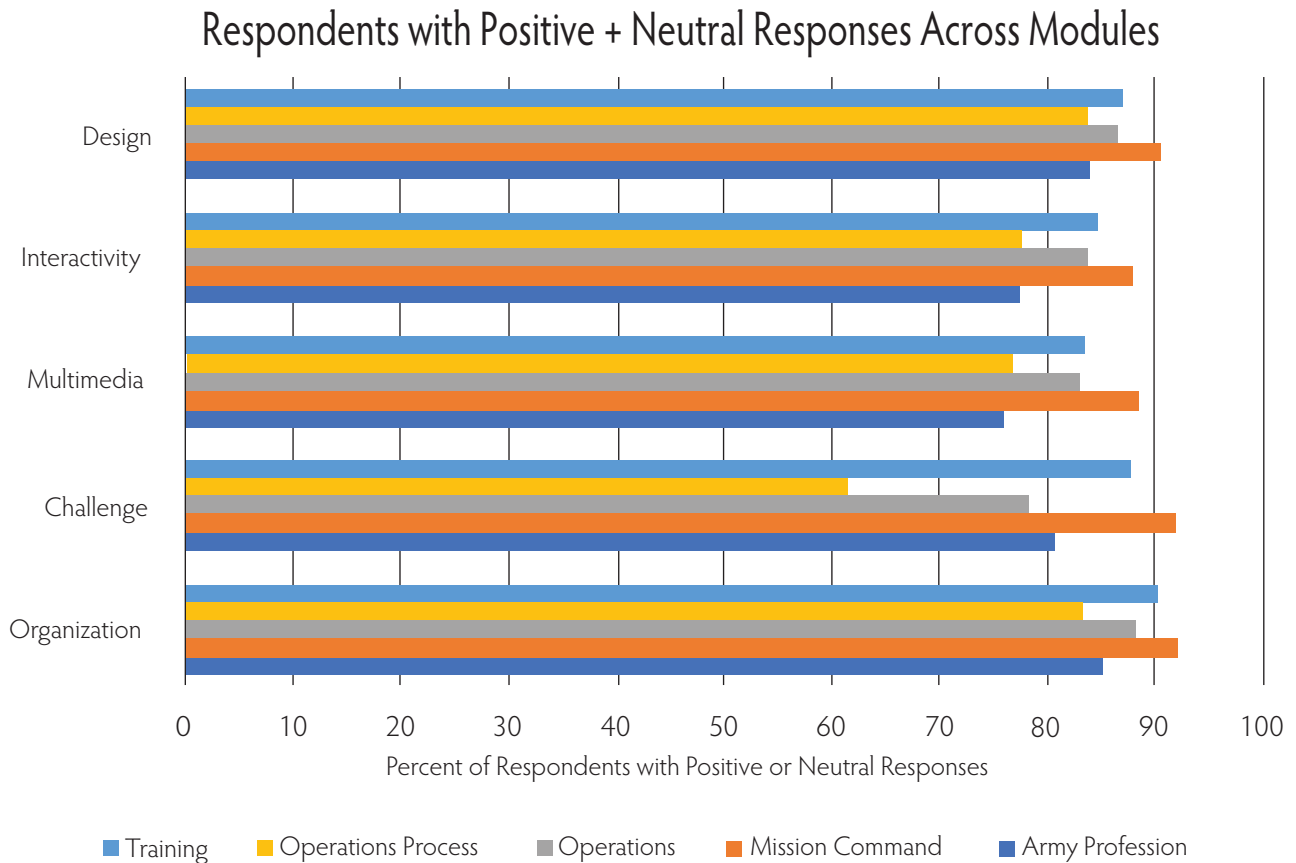
Respondents with Positive + Neutral Responses Across Modules

(Figure by Meredith Shafto, Shanda Lauer, and Steven A. Petersen, "Evaluation of the Captains Career Course Common Core Modernization Quarterly Report FY23 Q1 - FY24 Q1" [Fort Leavenworth, KS: Army University, 2024])

Figure 2. Perceptions of C5DL by Module

submenus that were clicked through to get resources; they preferred a centralized set of resources to download in a PDF.

Lifelong learning. C5DL had the unintended benefit of assisting learners in their duty positions prior to attending resident CCC, with 67 percent of the respondents stating that they could relate the content in the course to their current duties.[20] This means that prior to attending resident CCC, while still working their jobs in the Army, these officers were learning materials that were relevant to their positions. Arguably, this made them more knowledgeable in, and better at, their jobs.

The synergy between C5DL and operational performance shows the value of incorporating a lifelong (or career-long) learning model across the enterprise.[21] The lifelong learning model posits that education and learning should not be restricted to episodic bursts of classroom education between promotions.[22] These

institutionally provided educational "breaks" from the operational Army to attend PME courses are certainly value added, but they should not be the only PME an officer receives. The Army's self-development domain should be threaded through both the institutional and operational domains for other educational synergies to manifest.[23]

As the trend of education tends toward continuous lifelong learning, so too does the need to shift educational programs toward more independent and learner-controlled designs.[24] The adult learner is the one who determines if they get an excellent education and, therefore, must be an active participant in the learning process.[25] Engagement in asynchronous DL activities requires adult learners to become skillful at regulating their own learning. The learner must be motivated to do the work and think about what is being presented. All curriculum, in any modality, can be coasted through by doing the bare minimum, or even be passed

through cheating, if a learner is so inclined. Therefore, the educator's role in the sport of learning is not only to devise and deliver a program or course that provides an excellent learning opportunity for the adult learner but also to help learners develop the skills and mindsets that will enable them to manage their learning more effectively across the life- or career-span.

Students with low self-regulation skills and/or intrinsic interest in the learning materials may benefit from peer learning in future iterations of C5DL. One of the top issues for improvement was the desire for peer interaction. Forty-nine percent of respondents say they would have benefited from peer interaction, with the top preferred format of discussion boards.[26] Similarly, the finding from evaluations that 67 percent of responders could relate the C5DL material to their current duties suggests that common core topics are relevant for discussion in their work environment.[27]

There are currently no collaborative tools in the FY 2024 asynchronous C5DL-P to facilitate peer learning and provide learners a support network. The lack of social elements in asynchronous DL in Army PME has been echoed by others such as Raymond Kimball and Joseph Byerly as early as 2013.[28] However, the DL requirement does not have to and is not meant to prevent peer, collaborative learning. Units can leverage C5DL by incorporating it into their officer professional development training, for example. By making DL less of an isolated, individual experience, units can give officers an opportunity to collaborate with peers, as well as a more structured plan to complete the course. Meanwhile, the enterprise can explore courses of action to provide learners with more peer-learning capabilities as part of future improvements to C5DL.

DL and Army Culture

Many of the valuable components of the C5DL-P will be hard to achieve if Army leaders resist rather than embrace the value of DL course designs. Adding the DL-P to the resident CCC was a significant change in how the Army's active-duty captains have received PME since the Army's origin. A change of this magnitude required a change in culture that did not happen. Rather, the elimination of DL-P across the enterprise signifies that there are as many cultural as there are logistical barriers to implementing educational modernization initiatives.

The support of Army leaders in the operational force is a critical factor that can make or break educational modernization efforts. If operational leaders in the Army do not support the idea of DL-P, DL, or online learning in general, it results in a negative image of the course throughout the force. It then becomes challenging for students to find support for, and benefit from, the course. Furthermore, a negative perception of DL-P communicated to the student through their own leadership has the strong potential of anchoring and cementing the student's own negative bias toward DL. That negative bias has the potential of further reducing the student's learning gains by reducing interest, attention, and time on task during the DL portions of the course.

If the C5DL-P were allowed to continue for at least two additional years, the Army may have seen the requisite change in culture regarding DL and online education. As it stands, DL-P across the Army learning enterprise has been largely eliminated for the active-duty component. However, U.S. Army Reserve and Army National Guard officers will still be required to take C5DL-P and DL, and online learning in general will remain a key part of the educational landscape for the foreseeable future. Thus, culture and institutional support of educational technologies remain critical for future educational modernization efforts. Otherwise, the specter of another costly modernization effort implemented and eliminated within a three-year time-span looms in the distance.

Future Directions

The initial consideration of the C5DL case study suggests areas for further inquiry. Future research can provide more fidelity by focusing not just on whether a course, a module, or a lesson is effective. Instead, research efforts can shift toward understanding how specific elements of an embodied multimedia lesson influence learning and motivation. By doing so, one can expand the conversation from *whether* DL-P or online learning in general "works" to *how* to design interactive multimedia instruction that is maximally effective and engaging.

The elimination of DL-P does not necessarily mean that all active-duty PME should be fully resident, with no DL component threaded through in other ways. Further research efforts can help determine the optimal mix of online and in-person learning experiences. Additional inquiry into the optimal mix of

asynchronous versus synchronous online instruction is also warranted. Much of the extant research on blended learning seeks to answer whether *online* learning is effective.[29] However, less research focuses on finding the proper blend of technology-enabled learning activities for adult, and particularly military-affiliated, learners.

Researchers should focus on the interactions between motivation and learning outcomes within interactive multimedia instruction. In this article, the authors try to separate assessment of the course based on *effectiveness* and *perception*. It seems to the authors that critiques based on the learner's *motivation* to engage in DL are used in the military educational community to determine whether DL is *effective*. While there is a link between motivation and academic achievement, the nature of this relationship begs to be investigated for adult, military-affiliated, online learners engaging in interactive multimedia instruction.[30] Clarity in this regard will assist Army senior leaders and educational professionals in refining the criteria for what "good DL" is.

Conclusion

During the first year of the implemented DL-P, the impact of the modernized course design of CCC on schools, faculty, and students was quite variable in range. This is what one might expect since there are eighteen schools with several hundred faculty members teaching the modernized curriculum and over sixteen thousand officers enrolled in C5DL. It is evident that transitioning common core content to mostly asynchronous DL led to no loss of learning. In fact, there was a small but statistically significant increase in end-of-course exam scores for students the completed C5DL-P.

Online education has a place in professional military education. The technology used in and accessibility of DL curriculum is something that students of the twenty-first century are accustomed to and expect. However, online learning should not be viewed as a full replacement for residential, face-to-face learning. Research shows that the best practice of educating contemporary learners is to develop curriculum in multiple modalities.[31] When DL content is well developed and courses are well designed to ensure learning levels that can and should be met in certain modalities are taught in those modalities, DL can be a complementary and supplemental part of the residential PME process. Test scores and other program evaluation data shared in this article provide evidence this is what the modernized CCC accomplished.

There is still much work to be done regarding C5DL and CCC modernization. There is always room for improvement to both the in-person and online curriculum. The comprehensive program evaluation of the CCC continues as a part of the Army's cyclic instructional design process. But as for the course design, the authors posit that the introduction of C5DL as a mandated prerequisite to the resident CCC met the goal of improving learning effectiveness and efficiencies without degradation of training standards. At one year after its implementation, the modernized CCC created post-CCC officers more prepared to serve on brigade- and battalion-level staffs and lead company-size units. As we transition to less online prerequisites across the Army learning enterprise, innovative and thoughtful approaches to maintaining the learning gains of the last three years will be needed. ∎

Notes

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