



White Paper: Re-Thinking the Development of Mission Critical Teams

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Catalyst for Research

Within the assessment and selection pipelines of most Mission Critical Teams (MCT) [5, 6] it is assumed that intellectual preparation alone will enable candidates to successfully and sustainably evolve throughout the lifecycle of their chosen profession. The default mindset believes they will somehow “figure out” the physical, cultural, emotional, and existential transitions throughout their career. Long-standing research suggests that this assumption is false [8]. Candidates do not, in fact, “figure it out.” MCT Instructor Cadres must improve their ability to teach candidates how to transition in and out of the complexity and chaos of critical immersion events. Without scaffolded support, we will continue to see poor statistics on job satisfaction, attrition, mental health, addiction, suicide, and other mental health issues facing MCT’s current and past members (Specifically; Fire, Military Special Operations, Tactical Law Enforcement, and Healthcare).

Research Question

Individuals within an MCT must evolve their knowledge, roles, abilities, and identities multiple times within their career (i.e., from novice to teammate, to operator, to elder.). What developmental methodologies can be implemented to optimize a Candidate’s ability to make those transitions successfully and sustainably?

Existential Transitions

If asked to create a program to teach candidates of MCTs how to make the following four transitions skillfully, how would you do it? For illustration purposes, we use the educational development of surgeons as a proxy for the development of any MCT Candidate.

Classical Education Phase

Most students spend the first two decades of their life in a traditional schooling environment with the following characteristics:

- **Problem Set:** Simple/Complicated [9]
- **Temporal Environment:** Semesters
- **Learning:** Lecture-Based (Unconscious Incompetent [10])
- **Performance & Testing:** Primarily Individual
- **Potential for Conflict:** Low/Moderate
- **Consequence for Failure:** Low/Moderate
- **Feedback:** Respectful, Sterile, Delayed
- **Identity:** Receiver of Information/Follower [11]



[2]

Clinical Phase

Medical students graduating from the classroom portion of their education in May, find themselves in a team-based clinical environment in August [12].

- **Problem Set:** Simple/Complicated/Complex[9]
- **Temporal Environment:** Blocks, Shifts, Rotations
- **Learning:** Experiential (Conscious Incompetent [10])
- **Performance & Testing:** Individual/Team
- **Potential for Conflict:** Moderate to High
- **Consequence for Failure:** Moderate to High
- **Feedback:** From none to any type [13, 14].
- **Identity:** Teammate/Apprentice



Critical Phase

The resident may experience criticality within a few hours of starting their role. In this context, we define criticality as a team-based, decision-making environment of 300 seconds or less, where the consequence of failure is catastrophic injury or death. Not only does criticality differ in terms of information and consequence, it also differs emotionally and existentially.

- **Problem Set:** Simple/Complicated/Complex/Chaotic [9]
- **Temporal Environment:** Seconds and Minutes [15]
- **Learning:** Action-Based (Conscious Competent [10])
- **Performance & Testing:** Team-Based
- **Potential for Conflict:** Moderate/High/Extreme
- **Consequence for Failure:** High
- **Feedback:** Assertive/Aggressive/Immediate
- **Identity:** Stakeholder



Leadership Phase

At some point the individual will need to transition from doing a thing, to lead others to do a thing [16].

- **Problem Set:** Simple/Complicated/Complex/Chaotic [9]
- **Temporal Environment:** Seconds/Minutes/Hours/Days
- **Learning:** Reflective (Unconscious Incompetent [10])
- **Performance & Testing:** Individual/Team Based
- **Potential for Conflict:** Low/Moderate/High/Extreme
- **Consequence for Failure:** High
- **Feedback:** Any type
- **Identity:** Leader



Rethinking the Development of MCT Candidates

Mission Critical Teams (MCTs) are small [4-12 agents] integrated groups of indigenously trained and educated experts. These experts leverage tools and technologies to resolve complex adaptive problems in immersive temporal environments of five minutes (300 seconds) or less. Failure to resolve such problems may result in death or catastrophic injury [5]. Many current MCT professional development systems

(Orientation, Assessment, Selection, Training, and Development) remain anchored within Rational Actor Theory [17], which assumes candidates will make reasoned decisions allowing teams to select and prepare a candidate solely on their ability to do a job or task. The assumption further assumes that if we solely focus on preparing the candidate intellectually, they will somehow figure out the evolving emotional and existential transitions: “Who am I, and what is my purpose?”

In the context of MCTs, this assumption fails to understand candidates' initial assessment for membership within a specific tribal community and culture [18, 19]. A culture founded on being of service to something greater than themselves, of living a life of significance. It is the job of that community to determine if they share the teams' values, can make a cultural contribution, and possess the potential to achieve excellence in the skills and knowledge necessary to pursue the mission. The candidate's transition between the above four phases (educational, clinical, critical, and leadership) is not just a cognitive or behavioral transition of knowing new things. It is also the emotional, cultural, and existential transition of understanding new truths about themselves, where they belong, and their greater purpose.

When candidates choose to join an MCT, they choose to take the hard path—leaving the routine, or ordinary, world and enter the critical, or extraordinary, world [20]. If we only prepare them cognitively, we fail to provide the emotional, interpersonal, cultural, and existential skills necessary to navigate a new community and the chaotic uncertainty of the immersive critical world in which they will work and live [15, 21]. We *want* to believe that if we throw them in the deep end, they will figure out how to “swim” on their own. Instead, too many simply learn to “tread water” to survive under the right conditions. Add enough additional stressors, however, and “treading water can soon become drowning [22].”

Historical Precedent: Expeditionary Education in the U.K. Post WWI

As the institutional caretakers of other people's children, modern educational systems commit to the ethical belief that they must keep students safe while in their care. They do this, in part, by implementing predictable structures and schedules to reduce student exposure to chaos and uncertainty. These structures result in a lived experience where the predictable equilibrium of the Western routine world defines life norms. Only when those students decide to choose the uncertain path, entering the world of MCTs, will the Instructor Cadre need to prepare them for the critical world.

In 1939, as war broke out in Europe, limited life experience and faulty training unfairly correlated to unnecessary deaths of U.K. seamen in the Battle of the Atlantic [23]. Older sailors believed that adolescents who grew up between the world wars “had not acquired a sense of wind and weather, a reliance of their own resources, and a selfless bond with their fellows [23].” This lack of skill and understanding resulted from a generation coming of age in 1939 raised by mothers, and grandparents, still mourning the losses of their husbands and sons in the trenches of WWI. Resultantly, grief pushed guardians to teach children “Mindful[ness]” when facing risk or uncertainty or more bluntly put: “Avoid getting hit.” Conversely, older sailors emerged from a generation valuing “Robustness,” the idea that a person can take a “hit” and not be “knocked down” [24]. Only later in their lives, did they discover that Robustness would simply shatter when

faced with overwhelming force [25]. With this realization came a pivot toward resilience, the ability to recover and get back up after being “hit and knocked down.” [26].

By 1939, challenges of grappling with a new generation that lacked tacit skills and understanding of how to take the “hits” or quickly recover from them surfaced. Without resiliency, every hit had the potential to end in catastrophe [25]. At its core, this is not a theoretical problem remedied in the classroom. It is a tacit or applied problem that requires time in “the arena” to experience the emotions that come with adversity and failure. To address this challenge, a school principal named Kurt Hahn created a series of experiential trainings using the wilderness of mountains, forests, and oceans, within an expeditionary framework. At its core, the curriculum centered teamwork, challenge, and service. Initially called the County Badge System, it later evolved into both the Duke of Edinburgh Award and the Outward Bound School [23], both of which are still in operation. Kurt Hahn created numerous experiential exercises for military selection programs still in use today [27]. In facing challenges with the current generation, similar to that of 1939, developing Robustness, Resilience, and Mindfulness today requires understanding when to apply each in the face of rapidly emergent complex adaptive problem sets.

Expeditionary Education

Most candidates enter the MCT Assessment and Selection pipeline under the age of 25, which means they are considered adolescents [28-30]. At this stage of life, they continue to experience an evolution of identity and purpose as they pass through the previously mentioned four phases (educational, clinical, critical, and leadership) [20, 31, 32]. To provide better support during these transitions—while also building the foundational skills required to manage many other transitions occurring throughout their careers—they need an education and training methodology that provides the required developmental assets [31]. Expeditionary Education is a methodology which mimics the candidate’s larger developmental and existential journey.

Expeditionary Education methodologies utilize authentic, iterative, and immersive learning evolutions. These methodologies also structure a beginning, middle and end, marked by meaning-making rituals to emphasize the transition between the routine and the critical. These transitions require candidates to pass through liminality (meaning “threshold” describing the place “betwixt and between” [33]), which marks a boundary in space and time between the equilibrium of the routine world and chaos of the critical world [34]. Historically, communities which live closer to the land understood that these transitions were of great significance, physically and existentially, and should only be undertaken on purpose, never alone, and always with someone staying back to help us return [35, 36]. It is worth noting that there is an ideological difference within the larger experiential education field between utilizing expeditionary education to facilitate personal growth and utilizing it to more effectively transmit concrete knowledge and skills. Because of their unique problem sets, temporal environment, and team dynamics, MCTs must accomplish both goals.

The Problem Set

It is critical to understand that permanent Mission Critical Teams are a relatively recent phenomenon [5]. These teams specialized response to rapidly emergent complex adaptive problem sets uses speed and agility

impossible for the larger parent organization in which they are nested [9, 37]. In addition to speed and agility, they require an unconventional and explorative mindset to solve problems in novel and unique ways [38]. As a result, the MCT development pipeline must be designed to prepare students for the rapidly emergent complex adaptive problems of the critical world. It cannot just mimic the traditional training and educational systems designed to prepare a general population of students for the technical problems of the routine or conventional world.

The Temporal Environment

Each time a candidate transitions through liminality into an immersion event, they change their relationship with space and time. Similar to parachuting, all immersion events are temporary. Like parachuting, how you land is also negotiable. However, due to gravity, landing itself is not. You save the patient, victim, hostage or run out of time or options. Students entering their first immersion event face a rapidly emergent complex adaptive problem set [9], and they realize that neither the problem nor the solution is immediately obvious. They, and their team [39], will need to urgently explore and innovate [38]. There is no pause button, no time for a cup of coffee to collect their thoughts, only performance or catastrophic failure [5, 34].

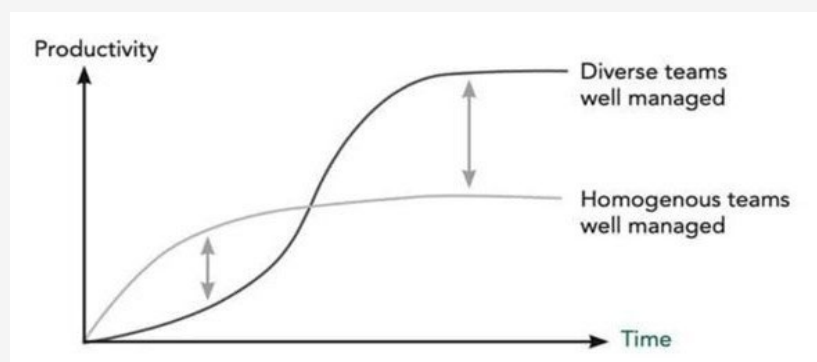
Yet, time is not as static as we might think. Ask anyone who has ever parachuted what they saw, felt, and sensed the first jump versus the 20th jump. Over time we can change our perception of time through “Temporal Expansion” [40], which allows us to focus all our mental energy on a specific phenomenon, thus “slowing” time. Think of it in terms of the shutter speed, or frame rate, on a camera. Great athletes can slowly increase their “...shutter speed from 100 frames per second to 1,000 frames per second, resulting in their ability to seemingly slow time or bend time and operate outside of the conceptual scheme of others [41].” These neurobiological changes, however, must intentionally develop through iterative meaning-making experiences.

The Team

Teams demonstrate greater effectiveness than individuals in solving time-constrained complex adaptive problem sets [42]. What we mean by “team,” however, continues to change. Historically, MCTs formed as intact, homogenous teams sharing values, experiences, and language. The evolving nature of MCT problem sets requires that they operate within liquid networks where roles and missions can be highly fluid [43]. This evolution sparked the emergence, and increased use of, what cross-functional teams, x-teams, or tactical swarms [15, 44, 45]. To be effective, candidates must transition from “good team member”

Figure 1

Timeline for team potential, based on team makeup. Source [6, 7]



to proficient in “teaming” as a skill [45, 46]. The challenge of preparing someone to be skilled at teamwork when entering a homogenous intact team [47] looks and feels different than for someone who needs to be adept at “teaming” [46] when building a heterogenous cross-functional team. In **Figure 1**, we observe that a heterogenous team can solve a greater range of problems due to greater neurodiversity [48], but these teams take longer to build. Building these teams also looks incredibly messy and dysfunctional compared to a homogenous team on the same developmental timeline. Knowing what kind of team to place a candidate is critical to designing the correct developmental process.

The Mission Critical Team Instructor Cadre

All MCTs belong to specific Communities of Practice generally sharing the same norms, traditions, and rules [49]. Within these communities, three distinct subgroups typically exist: the *Communitas*, the *Academics*, and the *Leadership*. The *Communitas* (represented in the form of the “Instructor Cadre” or “Cadre”) defines a group of people who successfully passed a shared Crucible or Rite of Passage experience (e.g., Selection, Medical Residency, Fire Academy) to become “Badged” (e.g., authorized to wear the team insignia, such as a medical white coat or a green beret) [33, 35]. These individuals maintain the sacred parts of the culture, which navigate the nature of human experience and its narration, norms, work, history, rituals, celebrations, losses, and ultimately the rites of passage used to assess and select the next generation [35].

The **Academics** (Researchers or outsider Subject Matter Experts) uphold rigor in the programs underlying science, processes, and procedures to ensure consistency, accuracy, and fairness. **Leadership** builds and maintains the mission, structure, and boundaries, while also mediating between the Academics and the Cadre in pursuing collaboration and synergy [50]. It is critical to understand that the only group that can bestow belonging and acceptance within the culture is the Cadre (the *Communitas*). Too often, however, Individuals who make up the Instructor Cadre are not the best of the community, but those the community don’t mind sending away to the schoolhouse. This dynamic often results in an Instructor Cadre who lacks the passion and language to role model and articulate the community’s norms and values. This critical failure often sabotages the ability of the *Communitas* to take a leadership role in forming their own culture. MCTs must recognize and take responsibility for the fact that The Instructor Cadres represent the elders of the communities that candidates attempt to enter and select them accordingly.

The Tacit Knowledge Transfer Problem

The first challenge the Instructor Cadre must overcome is the Tacit Knowledge Transfer Problem, or knowing how to ride a bike but not being able to explain it to someone else [5]. Experts, knowing more than they can easily explain, experience this problem when trying to articulate their tacit knowledge, such as teaching someone how to swim, parachute, or paddle [51]. This problem arises because concepts, such as balance and coordination, are difficult to articulate. They are not ideas but sensations and complex behaviors. This results in an Instructor Cadre, who knows what right “feels” like, inability to translate and articulate those feelings into instruction. In addition, tacit knowledge (A Posteriori) is communicated using *Emic* language, or the specific slang, inside jokes, and shibboleth emerging from their individual and shared experiences (e.g., “We don’t have a good feeling about them”) [52, 53]. The Academics, however, use more precise “Etic” language, which emerges from collective scientific and explicit knowledge (a Priori), to

describe their observations from outside of the *Communitas* (e.g., “Our tests indicate the candidate will not be successful”) [52].

Failing to overcome the Tacit Knowledge Transfer Problem creates two challenges for the community. First, during periods of community inflection, such as moments of selection or dismissal, the lack of ability to articulate their expertise as clearly as the Academics diminishes the cultural authority of the *Communitas*. Secondly, the Cadre cannot fully develop the potential of their candidates because their new instructors won’t be able to get past the “you suck, suck less” stage of feedback and development. The below sections rebalance this dynamic, helping the Cadre develop the skills and methodologies to translate their tacit knowledge into explicit knowledge, skills, and abilities others can clearly understand [5, 54].

Strategies for overcoming the Tacit Knowledge Transfer Problem

To effectively design the learning evolutions within an Expeditionary Education framework, the Cadre must first rethink the sequencing of experience and information and the intentional use of Emotion, Stillness, Story, Stress Inoculation, Risk, and Chaos.

The Sequencing of Learning Evolutions

Knowledge without understanding is as useless as data without context. MCT’s now have more access to human development and performance research than at any time in history. Access includes research on Mental Strength and Conditioning, Neurolinguistics, Mindfulness, and other techniques aimed at optimizing elite performers [55]. With good intentions, many teams are trying to build their candidates’ resilience by providing vast amounts of tools and information before entering the pipeline. Having a Ph.D. in the physics of being punched in the face cannot inoculate a candidate against physical, emotional, and existential shock from a punch to the face. Even worse, this knowledge may cause “increased anxiety and anticipation, rather than living in the moment [41].” In addition, this new information may lead candidates to try to choreograph receiving the punch based on theoretical knowledge. Choreographing can lead to false expectations, overconfidence, and complacency prior to the hit. It can also contribute to a loss of Situational Awareness and confidence after the hit as they try to reassess false assumptions [56].

By focusing only on their cognitive and, in some cases, physical capacities, we may be creating what some Instructor Cadre call “fitter quitters [57].” Instead of trying to prepare candidates of every contingency (the futility of this is seen in the original definition of the word Certainty: “That which decided by the gods [58].”), we instead build their adaptive capacity to operate within uncertainty. Instead of giving them the knowledge and skills *before* the experience, we first have them experience learning evolutions that combine intellectual, physical, emotional, character, and existential development through service, adversity, and team building [59]. We provide new models and theories *after* the experience to anchor them to the understanding that comes with newly acquired tacit knowledge.

The Intentional Use of Emotion

Is it ever appropriate for an attending surgeon to scream at a resident surgeon (student) during an operation? Initially my answer, and the answer of almost everyone I asked was no. We have all experienced emotionally

charged outbursts from unprofessional bosses aimed at transmitting shame and embarrassment. Now consider the same question differently: has there ever been a time in your career, or development, where when trying to change an old habit, getting a negative emotional reaction from a superior which provoked shock, embarrassment, and disappointment ultimately improved your performance? For me, and most people I asked, the answer is a reluctant yes. There is a connection between habit change and emotion, which is really important in developing Mission Critical Teams [60].

In critical environments, bad habits are hazardous to the student and the patient. The question is, how do we rapidly change bad habits in high-consequence environments? For example, somewhere along the way, a resident developed a harmful habit of making larger than required incisions on a patient. Upon seeing this mistake, the Attending Surgeon takes the resident aside, and calmly explains the correct size of the incision and the rationale behind that length. The resident acknowledges the bad habit and the need for change. Now imagine the old habit like a marble rolling down a well-worn track. Intellectually, the resident makes the decision to change the habit and builds a new track for the marble. The question is, how to move the marble to the new track. Even though the resident has intellectually recognized the need for the new habit, they cannot keep their hands from reverting to the old habit when stressed.

This continued failure to move from the old habit to the new habit means that the resident continues to cause unnecessary harm to patients. In this scenario, the instructor cadre must balance their responsibility for the resident's well-being and development against their ethical responsibility for the patient's health. Under the right conditions, an emotional stimulus (i.e., yelling at the resident, or quietly stating disappointment, etc.) the Attending Physician may be required to get the marble to jump from the old track to the new one [61]. For this intervention to work and not just be perceived as maleducative abuse by the resident, three criteria must be in place:

- 1.) The student must actually know and understand the right way.
- 2.) Continued failure to move to the new habit is causing patient harm.
- 3.) The Attending Physician must follow up after the event, with the obvious intent of helping them improve and help the student make meaning of their emotions [62].

To be very clear, for this intervention to be effective, the motivation of the attending physician needs to be explicit in wanting to develop the candidate and not just taking out their frustration on a subordinate. Unfortunately, the current lack of Instructor Cadre development within MCT's, and the increasing risk aversion within "School Houses" means that the historic roles of mentors within an apprenticeship system has degraded. Schools increasingly focus more on the students' evaluations of their instructors than with students' ability to adapt and learn. This breakdown means there are less structural incentives for Instructors to critique, emotionally engage with, or fail a student [63].

The Intentional Use of Stillness

One known phenomenon in the assessment and selection of MCTs is that candidates rarely quit when under duress. They quit when they are left alone with their thoughts and doubt, and anxiety overwhelm their

commitment [64]. MCT's have entered an age where their relationship with information and technology will need to evolve [65, 66]. Infinite access to data and information is equivalent to infinite access to food, drugs, and alcohol. More is not better; like food and drugs, some information is good for your health, and some is bad. Without internal discipline and restraint, information has the power to sicken and destroy us. The insidious challenge with data and information is that it is everywhere. We do not realize that we have lost the ability to be bored or alone with our thoughts until we do not have an electronic stimulus. Only then do we realize that we have let our "reflection muscles" atrophy [67]. This problem can get worse after selection when circumstances suddenly stop the music. A sudden injury, a family emergency, or any other multiple things that might take us offline for periods of time, may cause increased anxiety because candidates may not have the reflection muscles to hold off panic and anxiety [22]. It is up to us to help new MCT candidates develop a lifelong capacity to be still and reflective in a healthy and sustainable way.

The Intentional Use of Story

Human beings have told stories to transmit information long before they could write or even draw [68, 69]. This means that our brains are highly receptive to connecting and retaining information in the form of stories [69]. It is no accident that most religions use parables, analogies, metaphors, and other narrative forms to communicate beliefs. Stories help learners connect knowing to understanding. Telling stories is a way to connect the candidates' lived experience, of shared adversity and suffering, with the actual life they are trying to enter rather than just the recipients of abuse. It also helps to connect the candidates to a larger historical narrative of the team or the personal narrative of the instructor. As candidates begin to see themselves within the narrative they can begin to transition their relationship with adversity and suffering from one of sorrow to one of seeing suffering as privilege [70, 71]. In doing this, the Instructor Cadre, as elders in the *Communitas*, give candidates permission to transition from who they were to who they can be.

The Intentional Use of Stress Inoculation

The MCT pipeline needs to reflect the actual lived experience of the operators, which means they need to mimic the stressors candidates will encounter when they ultimately join the team. Too often, however, candidates leave the pipeline because they have an acute stress response (ASR) that has yet to evolve enough to differentiate between actual and perceived threats [72]. To overcome this problem, we need to design orientation programs that incrementally and iteratively increase the psychological, physical, emotional, cultural, and existential stressors to allow time for the candidate's brain to recognize and categorize the experiences [73, 74].

The Intentional Use of Risk and Chaos

Unlike careers based within the routine world, MCT's constantly transition in and out of the unpredictable and immersive world of criticality that exposes them to chaos, uncertainty, threat, and opportunity [20, 33, 35]. Core to the Expeditionary Education methodology is the use of wilderness [75] or, as it was once defined, "that which could not be controlled" [76]. Stepping off the road or the dock is a ritualistic transition between the predictably routine world and the chaotic critical world [33]. It is worth noting that the word "chaos" is almost unchanged in pronunciation from the ancient Greek "khaos" from over two thousand years

ago and references one of the first primordial gods whose domain was the chaotic and disordered threshold between heaven and earth [77, 78].

While true wilderness may not be accessible or desired within the context of MCT student development, intentionally exposing students to risk, danger, and adversity, in a structured way, is a necessary element to increase their capacity to be Robust, Resilient, and Mindful within criticality [78, 79]. The changing nature of our technology and culture often limits our ability to create these educational opportunities. Take, for example, the development of quarterbacks within Professional Football (NFL). The emergence of video games means young quarterbacks are more prepared conceptually for football. They grew up playing NFL video games that allow them to play from a quarterback's perspective rather than having to make meaning of their performance from watching a side-view game tape.

During the same period when video games came online, however, the emerging science of brain injury prompted the increased use of 7-on-7 tournaments at the middle and high school levels to train developing quarterbacks. These tournaments occur within a less physically stressful and more protective environment, which often means they are *less* prepared for the physical, psychological, and/or emotional stress and shock of being pressured, hit, and/or sacked in the pro league [80]. In the same way, protecting our students from harm or risk during their training reduces their ability to respond effectively when adverse events happen in real life. In the simplest terms, our need to protect surgical residents, firefighters, and tactical police reduces their exposure to events that may stress inoculate them against the authentic stressors they will encounter in their career [74]. Under the well-meaning guise of keeping candidates “safe,” MCT’s are increasingly reluctant to intentionally expose candidates to risk and danger within the routine world of training, which ironically may increase their chances of being killed, or harming a patient when they enter the critical world.

Overcoming the Risk Paradox and the fallacy of Safe

The larger challenge of the intentional and disciplined use of risk, hazard, and chaos is the eternal tension between the fact that MCT’s, which are built to navigate critical environments, are housed, or nested, within parent organizations that may only operate in the routine world. This tension invariably leads to what Experiential Education calls the Risk Paradox [81]. The Risk Paradox emerges from the fact that Cadre must expose candidates to risk and hazard to build their capacity to survive the critical world. In doing so, Cadre must also work with or for those who only know the routine world and deeply believe the best way we keep students safe does not intentionally expose them to risk and hazard.

To make things even more complicated, some of those in the routine world falsely believe they “mitigate” risks and hazards through the standardization and predictability of instruction and practice when they instead “trade” risks. For example, in responding to increased incidents on military rifle ranges, administrators may reduce access to the range to reduce incidents. While this action will statistically decrease incidents on the range, it will also reduce the amount of live-fire training a candidate receives, which may cause them to suffer a combat incident. This trend continues because those living in the routine world benefit from reducing range incidents while never being exposed to “combat” incidents due to a lack of training in the critical world. Too often, “keeping students safe” is not a statement of responsibility but one of fear as they

do not want to take responsibility for the uncertainties of authentic training. Instead of reducing the risks to the candidates, they instead traded the negative impact to the candidates themselves or their patients [37]. Lastly, there is always a danger that those who have only ever known the routine world believe they understand all that is required to prepare someone for the critical world. The enduring challenge and responsibility of the *Communitas* is to find ways to communicate the unique demands of the critical world to those who have never been there.

Designing the Expeditionary Learning Cycle

Once the Cadre understand the principles of sequencing experience and knowledge, and are versed in the intentional use of emotion, stillness, story, stress inoculation, risk and chaos, they then need to design immersive learning evolutions that mimic the candidate's future lived experiences with the critical world. Historically, Expeditionary Education has utilized journey's in and out of the wilderness [79] as an analogy to a student's journey in and out of the critical world. Nested within that journey are many challenges or learning evolutions. The following five steps were developed from integrating numerous Experiential and Expeditionary learning models [82-84] to balance the needed acquisition of knowledge, skills, and abilities required to do the job with the development of the individual to join a unique culture and transition through multiple roles in their career. The intent is for the Cadre to build the increasingly different learning evolutions around five questions: The Why? The Who? The What? The So What? The What Now?

1. Purpose “The Why”

We need to start with the “Why” in order for students to begin to “Own” the problem [85]. Why are we embarking on this expedition? What is the point of it? What is the relevance to my future lived experience?

Question: How is the Instructor Cadre framing the coming experience to the candidates? What is the purpose of it? What specific problem set (s) should the candidates focus on?

2. Permission “The Who”

When candidates first begin moving from learner to teammate, they need permission to move from passenger to crew, from the audience to the stage, by the Cadre [63, 86]. More specifically, they need help owning their singular technical task and role while also “owning” their evolving role within the entire operational problem set [87]. Instead of waiting for direction, they must learn how and when to step up and back in a fluid and dynamic manner—moving from followership to membership. Ultimately, if done well, with the right Instructor Cadre skilled at transferring tacit knowledge, the process improves how the instructor sees the candidate as well as how the candidate sees themselves.

Question: Has the Instructor Cadre given explicit permission or set expectations as to what role the candidates and/or the team needs to play in the next learning evolution?

3. Scaffolding, Observation and Diagnosis of the Experience “The What”

Does the Instructor Cadre know what right looks and feels like within the evolution? What specifically does the Instructor Cadre want to see, hear, sense, and feel while observing the evolution? Neurologically upon entering the Immersion Event, such as the start of a Trauma Resuscitation, combat, firefighting candidates

pass through some or all of the following neurobiological processes: Detection, Recognition, Reaction, Response, Reset, Recovery, and hopefully Reflection [15]. Is the Cadre able to diagnose difficulties in each of those phases? Once diagnosed, do they know how to intervene? Do they know when they should and should not intervene? The goal of designing authentic immersive learning evolutions is to help candidates and teams build the speed, agility, and capacity of each neurobiological process.

Question: Does the Instructor Cadre know what specific behaviors they are looking or listening for from the candidates and team performance? Have they thought about when to and when not to intervene?

4. Narrative Inquiry – “The So What”

To paraphrase the iconic Fred Rogers, we cannot fix what we cannot talk about [88]. One challenge that all new Instructors face is that it is much easier for new and untrained Cadre members to articulate what wrong looks like than what “degrees of right” feel like [89]. To move from a transactional Instructor into a transformational Instructor, members of the Cadre need to move from trying to fix behavior to that of unleashing potential. If there is one truth of MCT’s, it is that all great teams use Debriefs, Hot Washes, and After-Action Reviews (AAR) to make meaning of a shared experience.

It is also true that all bad teams don’t debrief or debrief poorly. A bad debrief leaves the participants with one of two unhelpful beliefs. First, the person leaves with doubts about themselves and/or their teammates, which can undercut their connection and belonging to the team without learning from the perceived mistakes. Second, they may walk away from the debrief without understanding, forcing them to make meaning of the event in isolation. I have watched people slowly self-destruct because they could not understand “why” something happened, why someone made that choice, or why they themselves were not fast, smart, talented, or lucky enough to influence the outcome of a critical event. To be even more specific, they leave the event telling the *wrong* story. Improving this outcome requires a breakdown of the meaning making process into three phases: 1) the collective meaning-making, 2) the theoretical model (theory in which to anchor the experience), and 3) the story, which weaves it all together in a form that is both accessible and easily retained.

Narrative Inquiry: Making Meaning of the Experience

Some of the teams we work with have begun transitioning from an AAR which focuses on “What went wrong?” or “What can we do better next time?” to one that asks, “What story will people tell themselves tomorrow about this event?” What is the story they will tell themselves later about the team? What story will they replay in their heads about themselves? What narrative gets changed or reinforced by making meaning, or learning from, an extraordinary event? Narrative Inquiry is the idea that if we want to influence performance, we should first start by understanding and influencing personal and team narratives [90, 91]. For example, is it a story of failure or growth through failure...?

Question: What was the story of the experience? How is the instructor Cadre influencing the candidate's narrative?

Anchoring to Theory

What specific tool, such as a leadership model, a mental strength technique, or a physical skill, can candidates learn that can help them perform better in a similar evolution in the future?

Question: What theory or skill needs to be taught in relation to the learning evolution?

Anchoring to Story

What story can the Instructor Cadre tell, about their own experiences, the past experiences of the team, or another authentic source, which can help tie together the experience, the candidates evolving narrative, and the specific theory which was just taught to them? This story can help the students see the relevance of the experience and theory, and more easily retain both within their memory.

Question: What story can the Instructor Cadre tell to weave the experience and theory together within the students' memories?

5. Existential Transition “The What Now”

Within Expeditionary Education, candidates often confront a choice between who they are and who they might become [86, 92, 93]. Faced with fear or anxiety about heights, swimming, and public speaking, the candidate must internally decide whether they will stay where they are or move toward that which repels them [94]. Too often, however, candidates will require the support of someone they trust to believe in them more than they believe in themselves. For this reason, the Cadre must take responsibility for engaging with their students/candidates as elders within the Communitas, as the role of elder is critical to helping the next generation transition from who they once were into who we need them to become.

Question: How is the Cadre supporting the candidates to transition from who they were into who we need them to become?

The Limits and Hidden Costs of Simulated Learning Evolutions

It is important to note the limitations of Expeditionary Education, or Simulated Learning Evolutions.

- **Opportunity for experimentation:** Because simulations leverage highly predictable scenarios, they play a critical role in experimentation in ways that are not possible or prohibitive within surgery, auto racing, firefighting, etc.
- **Danger of overconfidence and complacency:** In an interview with an engineer in Formula One, it was noted that driving simulations are excellent for developing both the visual cortex and fine motor skills, which in turn puts less pressure on the drivers working load memory as they attempt to manage uncertainty in the actual race car [95]. The downside of the predictability of simulated experience is that it may underrepresent the variability during an actual mission. In an actual race car, for example, the maximum number of consistent iterations, without the need for adaptation, is very few, which might inadvertently build overconfidence and complacency in the driver [95, 96].

- **Possibility of developing new learning capabilities:** Air Force Instructor Pilots transitioning pilots from 4th generation to 5th generation fighter planes note that it is no longer just about moving a pilot from one airframe to another. In a fifth-generation fighter plane, it is more accurate to say the pilot is no longer flying a plane but instead managing the supercomputer, which is flying the plane. In practice, this means new F-35 pilots must learn how to interpret what the supercomputer is displaying to them and what the plane is actually doing to make tactical decisions. An entirely new training and education problem emerges when the computer updates its algorithms and changes how the plane behaves. The old habits, the pilot just learned to anticipate the previous version of the software, might interfere with their performance with the updated software [97]. Considering the science of habit development and habit change, this represents a significant educational problem for future technological and human interactions. For the next generation of pilots, surgeons, and race car drivers, the question becomes what habits can remain stable in the face of overwhelming information and rapid technological change.
- **Simulations are not always predictive of performance:** It is a known phenomenon within Professional Football (NFL) that some players consistently perform exceptionally in practice and poorly in games, while other players are terrible in practice but exceptional under pressure [41].
- **Potential lack of emotional or kinesics engagement:** In addition, current simulation technology does not inoculate drivers from distracting variables such as vibrations, fear, the threat of other drivers, or pulling 4g's (gravity) [95].

The bottom line is that simulations are excellent for scaffolding candidate skills to navigate uncertainty, but they are never a replacement for the lived experience of navigating true uncertainty.

Conclusion

The current training and education strategies used to develop candidates who have chosen to join a Mission Critical Team are no longer sufficient. We can no longer tolerate siloed developmental methodologies created to prepare people for the first few months or years of their careers. We must begin to design integrated training and education programs focused on preparing a candidate to excel within their role and sustainably manage the many transitions of role and identity that come with their unique journey upon the hard path. For too long, we have allowed our Cadre to prepare candidates to tread water while calling it swimming. We are then surprised when they sink after not being able to make meaning of experiences within a Mission Critical Team [70]. We can no longer assume that if we sufficiently prepare someone intellectually, they will figure the rest out. They are, in fact, not figuring it out with dire consequences. The inability to sustainably manage the many transitions of role and identity throughout their career and life has meant that the residue left by some experiences too often becomes a deepening sorrow that often destroys them rather than the wisdom required to teach the next generation [70]. Rethinking our professional development programs will allow us to strengthen future operators' abilities to sustainably navigate rapidly emergent complex adaptive problem sets while also developing the robustness, resilience, and mindfulness required for the many transitions throughout their career and life. Members of MCTs should not have to sacrifice their lifelong pursuit of happiness when they choose to live a life of service [98, 99].

Research Methodology

The Mission Critical Team Institute is an applied research organization focused on supporting our partnering Communities of Practice to engage in sustainable organizational change through collaborative inquiry and shared learning [50, 71, 100-104]. Since MCT's often lack access to academic journals, and the language in which they are written, MCTI has adopted the Kaupapa Māori engagement principles of *initiation, benefits, representation, legitimation, and accountability* to better understand each community's unique systems of knowledge and ways of knowing while supporting their ongoing evolution, development, and innovation[71, 102, 105-107]

Observation Stage: Observing a Novel Phenomenon

Emerging from our ongoing MCTI community work, we occasionally encounter a novel phenomenon occurring across teams, which may not be represented in the literature. To determine if this research will have value to the larger MCT community, we will write a "Green Paper" [108]. A Green Paper is a consultation document that includes initial observations and assumptions.

Green Paper: Ideation and Representation Stage

The first version of the Green Paper is sent out, unfinished, to the MCTI community for reactions and comments. Over the years, we have adopted the "Unfinished Principle" when distributing first drafts of a Green Paper. By sharing a document that has not been fully edited (meaning some grammar and syntax errors remain), individuals are more likely to provide feedback, when they otherwise might not, to help us "finish the paper properly." Their engagement is critical to ensuring their voices and Ideas are integrated and fairly represented. In the case of this paper, the Green Paper underwent ten iterations over ten months before being sent to a copyeditor and transitioning to a Gray Paper.

Gray Paper: Legitimation and Accountability Stage

A Gray Paper is our method for generating a final peer review prior to publication as a White Paper. The Gray Paper is re-distributed to the MCTI Community worldwide, as well as trusted researchers, academics, and subject matter experts, for final feedback and suggestions. Once these comments are validated and accounted for, the paper becomes a White Paper.

White Paper: Final Stage

The final paper is reformatted into a White Paper, which is distributed to the teams and made public via the MCTI website.

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