

Raising Cultural Intelligence through Metacognition

Preparing Tomorrow's Air Force for the Complexities of Cross-Cultural Engagement

SMSGT BENJAMIN STEEL, USAF

Introduction

Today's Air Force finds itself on the precipice of historical change. For the first time since the end of the Cold War, the United States is being challenged by near-peer adversaries with the strategic reserves, political will, and technological capability to upset the global balance of power. This situation represents a significant challenge to our leadership in the international arena. As recent events have shown, continued American leadership in the international system will require the combined strength of the US and of our foreign allies. As noted in the unclassified 2022 National Defense Strategy Fact Sheet, "mutually-beneficial Alliances and partnerships are an enduring strength for the United States and are critical to achieving our objectives." However, such partnerships are only possible if leaders understand each other. Cultural differences between the US and other nations raise the risk of misunderstanding, miscalculation, and missed opportunities. The Air Force needs intellectually adaptive leaders that have the capacity to navigate culturally complex spaces and who can forge lasting partnerships that support our national security.

Success in building international partnerships depends significantly on leaders' cultural intelligence. Leaders who possess a high degree of cultural intelligence can think on their feet; they can navigate cultural differences in real-time and adjust their behavior to avoid missed opportunities. The Air Force's approach to improving cultural intelligence has hitherto focused primarily on teaching the dimensions of culture and on exploring cultural variability between specific cultures (i.e. the 12 dimensions of culture, differences between the collectivist and individualist societies, etc). While this approach provides a useful framework for understanding culture, it does not train leaders to be adaptive, self-regulating and flexible in their approach to cross-cultural interactions. In short, training of this kind improves *Airmen's cognition about culture*, however, the Air Force needs to train its members to be *metacognitive* – to think on their feet and adapt their behavior during cultural interactions. The Air Force should develop culture training that deliberately develops our leaders' metacognitive cultural intelligence.

Key Questions

- This article is a literature review. It will assess whether the approach currently used by the Air Force represents an optimal way to raise Airmen's cultural intelligence (hereafter CQ). Specifically, it seeks to ask three related questions:
- 1) Is knowledge about cultures, including the various ways in which cultures differ, enough to promote CQ?
- 2) Which aspects of CQ are most important in training designed to improve CQ?, and
- 3) What kinds of learning activities are ideally suited for raising Airmen's CQ?

The literature review does not provide definitive answers to these questions. Such answers would require a controlled study and empirical data. However, the mixture of quantitative and qualitative studies that deal with this subject represent a fruitful ground for further exploration and should be carefully considered by planners of future Air Force culture training.

Before delving further into the literature, a few key terms need to be defined. The following section elaborates definitions for two constructs that feature centrally in the literature, namely: metacognition and cultural intelligence.

Metacognition

In the simplest terms, metacognition can be understood as thinking about thinking¹ or “knowledge and cognition about cognitive phenomena.”² It is important to note, however, that rather than “thinking about thinking” for its own sake, metacognition refers to the way people use knowledge of self, tasks, and strategies to regulate their own learning and behavior.³ In other words, metacognition refers both to a learner's awareness of their learning processes and to the ways in which this awareness helps them direct their own learning.⁴

Metacognition can be applied to the learning of cultural competence. Metacognition consists of both metacognitive knowledge and metacognitive regulation—knowledge about ones' cognition and the ability to regulate ones' learning using that knowledge.⁵ In a cultural learning scenario, Airmen may be aware that they have information gaps about a given culture (e.g. not knowing dining etiquette), understand what they are being asked to do in a specific situation (e.g. exhibit proper dining etiquette), and know of some strategies they can use to accomplish this task (e.g. watching how others eat before eating themselves). These represent different kinds of metacognitive knowledge. In cross-cultural learning scenarios, metacognitive regulation involves using this knowledge during an interaction. This may take the form of pausing before doing something

(e.g. not eating immediately but choosing to watch how others eat first). It may also involve watching how one's actions are coming across (e.g. looking at people's facial expressions while eating to look for evidence of disgust or disapproval), or looking back to see how an interaction went after it occurred. Both metacognitive knowledge and regulation thus play an important role in successful cross-cultural interactions.

Cultural Intelligence

The four-part framework for CQ used in this literature review was first proposed Ang and Earley in 2003. Unlike the Intelligence Quotient (IQ) associated with general intelligence, which focuses on cognition itself, CQ focuses specifically on cross-cultural settings; it describes people's ability to negotiate culturally complex situations and accomplish tasks within those settings.⁶ CQ refers to a system of factors that "allows people to adapt to, select, and shape the *cultural* aspects of their environment" and is therefore domain- and situation-specific kind of intelligence [emphasis added].⁷ CQ is a multi-dimensional construct. It includes cognitive, metacognitive, motivational, and behavioral components.⁸ Crucially, of the four components of CQ, metacognition has been identified as the critical link between cultural knowledge and cross-cultural skills, bridging the gap between cognition and behavior.⁹

Components of Cultural Intelligence

The four components of CQ described by Ang and Earley are discussed below. This four-dimensional model of CQ is has been validated in separate studies.¹⁰

Cognitive CQ

Cognitive CQ refers to declarative knowledge about specific cultures and about cultural differences in general.¹¹ Cognitive CQ is knowledge the learner possesses. This could include the awareness that people in the Middle East generally do not shake hands with their left hand, or that Japanese business executives place great value on exchanging business cards. Additionally, it may include knowledge of cultural variability, such as an awareness of Hofstede's dimensions of culture, the 12 dimensions of culture, general differences between collectivist and individualist cultures¹² and value-based models of culture, among others.¹³ Cognitive CQ represents the knowledge that enables individuals to make culturally appropriate choices, or to withhold judgment or action, and is a prerequisite for other components of CQ.

Motivational CQ

The motivational aspect of CQ is related to the degree of effort people exert toward improving their cultural intelligence as well as to an individual's belief in the efficacy of their approach.¹⁴ Motivational CQ refers to attitudes the learner adopts. Knowledge about cultural phenomena is not enough to cause individuals to act in ways that reshape the cultural aspects of their environment. As with any endeavor, people must make an effort to learn the skills and knowledge associated with navigating cross cultural situations. Examples include taking the time to learn about other cultures, appraising CQ as important, and deciding to persist in learning a language despite difficulty.

Behavioral CQ

Behavioral CQ refers to the behaviors an individual engages in during the negotiation of a cross cultural exchange.¹⁵ Behavioral CQ refers to practices the learner adopts. It is where the knowledge of Cognitive CQ is applied to specific culturally heterogeneous situations. Behavioral CQ is the result of Motivational CQ applied to Cognitive CQ. Examples include not shaking hands with the left hand, choosing to dress in ways that conform to another culture's expectations surrounding modesty, and so on.

Metacognitive CQ

The metacognitive component of CQ describes an individual's awareness of their own cultural skills, an awareness of the ways their own culture may diverge from other cultures, and the ability to apply this knowledge to alter their approach to cross cultural interactions.¹⁶ Metacognitive CQ involves monitoring and regulating one's approach while negotiating cultural interactions.¹⁷ It is the aspect of CQ where individuals plan, monitor, and revise their approach to cultural interactions.¹⁸ In this sense Metacognitive CQ is similar to metacognition in general. As noted, and as will be further developed in the following sections, metacognition consists of two principal dimensions: metacognitive knowledge and metacognitive regulation through planning, monitoring and evaluating ones approach to a cognitive task.¹⁹ Metacognitive CQ thus describes the degree to which an individual is conscious of cultural differences between themselves and others, and the degree to which an individual can use this awareness to regulate their behavior vis-a-vis an interlocutor from another culture. Examples of behaviors that derive from Metacognitive CQ include pausing to withhold judgment, intentionally taking the perspective of an individual from a different culture, and adjusting one's

behavior during an interaction while attempting to induce an understanding of an interlocutor's cultural norms.

Interactivity of the CQ Model

As with other multi-dimensional models, these four aspects of CQ should not be understood as distinct and separate processes. The dimensions of CQ interact in various ways: Motivational CQ drives Behavioral CQ because motivation prompts action; Motivational CQ is driven by Cognitive CQ because motivation depends on knowledge of possible courses of action, and so on. Even so, it is the view of this author that Metacognitive CQ undergirds the entire CQ construct and that Metacognitive CQ is therefore arguable the most important dimension.

A model of interactivity between the CQ dimensions is presented below.

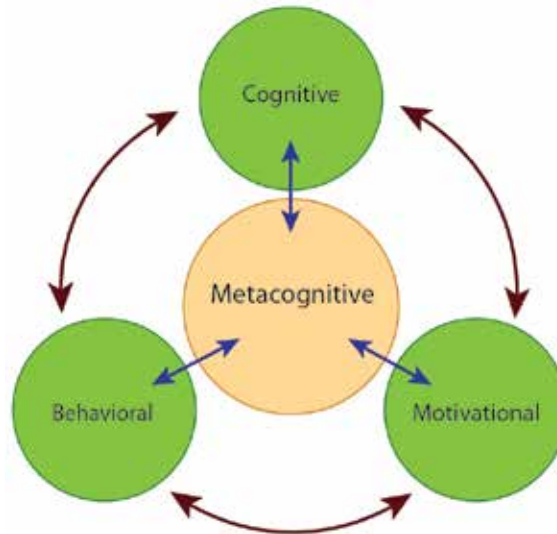


Figure. Interactivity model of CQ dimensions

Source: Based on Ang and Earley and Thomas et al.²⁰

To illustrate the centrality of Metacognitive CQ, one may consider the following relationship between cognitive and Metacognitive CQ: as noted, metacognition consists of knowledge coupled with self-regulating practice that plans, monitors and evaluates actions.²¹ In this sense, an individual needs to know what strengths, weaknesses, and prior knowledge they possess, what task they are being asked to perform, and what strategies are likely to result in a successful outcome. In terms of Metacognitive CQ, an individual must know about foreign cultures, about their own repertoire of cultural skills, and about cultural strategies that can

help them achieve their goals. In other words, Metacognitive CQ depends on Cognitive CQ. On the flip side, as metacognitive practices are applied and adopted by an individual, they also inform that individual's Cognitive CQ through the process of learning. Each time an interaction succeeds, the individual's repertoire of knowledge improves. In other words, Cognitive and Metacognitive CQ interact in mutually reinforcing ways. Similar relationships can be expected between Behavioral CQ, Motivational CQ, and Metacognitive CQ.

The preceding suggests that metacognition cannot be separated from the other dimensions of CQ. For this reason, the remainder of this literature review, including the recommendations that follow, should not be construed as an attempt to focus on Metacognitive CQ at the exclusion of the other dimensions. However, training that focuses explicitly on metacognition will likely yield mutually reinforcing gains in the other dimensions as well.

The Value of Cultural Intelligence

CQ is an indispensable skill in today's rapidly globalizing international setting. Though the Overseas Contingency Operations in Afghanistan have ended, and despite a recent shift in the National Security Strategy toward Great Power Competition, the Air Force will likewise continue to engage with nations comprising a wide variety of cultures. The Air Force needs culturally intelligent leaders that can thrive in these settings.

CQ training has proven to be very valuable.²² A meta-analysis featuring data from 1611 participants across 21 studies shows this clearly: cross cultural skill development, performance, and adjustment for each improved as a result of CQ-raising interventions.²³ Another study showed that improving CQ impacts cultural judgment and decision-making, adaptation, and task performance.²⁴ CQ is necessary if leaders are to engage meaningfully with participants from other cultures and accomplish tasks in culturally complex settings. Cultural differences can limit individuals' ability to accurately perceive the intentions of their foreign counterparts. For instance, it has been found that people from more individualistic cultures tend to be less accurate in diagnosing their counterpart's interests than those who come from collectivist cultures.²⁵ Conversely, when people's CQ levels are higher, they are better able to understand the motives of others and can even adjust their behavior to match the expectations of others. In a 2010 study, participants who adopted the perspective of a culturally different group (a form of metacognitive perspective-taking) tended to mimic the behaviors that match the expectations of that group and were less likely to use cultural stereotypes in their

assessments of others.²⁶ In other words, metacognitive perspective-taking can mitigate the role of cultural stereotyping, a cognitive bias that could easily lead to miscalculation in culturally complex settings. Motivational CQ is positively related to job performance. A study among 305 real estate agents in the US showed that Motivational CQ positively correlates with the number of housing transactions between people of different cultural origins.²⁷ Another study of 124 American and East Asian negotiators measured the correlation between CQ levels and the outcomes of negotiations.²⁸ Individual differences such as international experience, personality, and other types of intelligence were controlled for. The study found that CQ positively predicts individuals' ability to integrate diverse information, resulting in improved negotiation outcomes. In other words, CQ can help promote cooperative outcomes and may facilitate win-win situations; conversely, a lack of CQ could impede the chances of arriving at a cooperative resolution. The evidence cited above shows that CQ confers a variety of concrete benefits that can help Airmen achieve their objectives in multicultural settings.

The Unique Role of Metacognitive CQ

While each of the components of CQ are important, the role of Metacognitive CQ is particularly important.²⁹ Metacognitive CQ strongly predicts cultural judgment and decision making: in a seminal study, 235 undergraduate students from the mid-western United States and 358 Singaporean undergraduate students were given a cultural intelligence scale (CQS).³⁰ The CQS measures individuals' performance along each of the four CQ dimensions.³¹ The students were then presented with scenario-based cultural judgment tests and multiple-choice decision making tests. The scenarios featured culture pairs that differed from the examinee's in terms of collectivism, power distance, masculinity, and high/low context. Researchers controlled for age, sex, EQ, IQ and a variety of personality traits.³² The study found statistically significant effects: Metacognitive CQ levels predicted cultural judgment and decision making.

Metacognitive CQ has also been shown to improve trust, leading to better intercultural collaboration and creative idea-sharing.³³ A separate study divided 43 mid-level managers from US executive MBA programs into high- and low-CQ level groups. The researchers then compared each group's performance with multi-rater assessments from different culture counterparts to assess the managers' ability to collaborate across cultures. Managers with higher levels of Metacognitive CQ were rated higher by peers from other cultures in terms of intercultural negotiation and collaboration than those with lower Metacognitive CQ. Similarly,

social network analysis confirmed that managers with low levels of Metacognitive CQ shared less information with intercultural peers than their counterparts with high Metacognitive CQ. In this study, Metacognitive CQ had a positive effect on trust and a positive effect on the likelihood to share new ideas. The researchers found that “managers with lower Metacognitive CQ are less likely to have developed . . . trust in their intercultural relationships and are thereby less likely to share new ideas in these relationships.”³⁴

Metacognitive CQ (specifically perspective-taking, wherein individuals consider how another person’s cultural background might shape their behavior) can significantly improve intercultural coordination and cooperation.³⁵ Mor et al., conducted two studies to examine this relationship. One study used a sample of 200 MBA students and measured participants’ CQ levels using the cultural intelligence scale (CQS); the participants were then evaluated by intercultural peers on perspective-taking and a variety of effectiveness measures. Metacognition was again positively associated with peers’ evaluation of target students’ levels of cooperation.³⁶ A separate study published in the same paper placed 57 American MBA students in prisoner’s dilemma with an imagined Chinese counterpart. The study found a positive effect between cultural perspective taking and intercultural cooperation.

The literature clearly shows that Metacognitive CQ plays a central role in improving cultural performance. Despite this note that most cross cultural training has historically focused on preparing individuals to operate effectively in a particular culture, but has not taught them how to adapt to cultural differences in general.³⁷ In other words, culture training has generally focused on cognitive knowledge rather than on metacognition. The former kind of preparation addresses only the cognitive component of CQ, but the evidence stresses the need to develop leaders who can adjust to a wide variety of cultural settings. Metacognition is the key to this ability. Citing British psychologist Edward de Bono: “unless you know everything, what you need is thinking [emphasis added].”³⁸ In other words, you can’t prepare Airmen for all cross cultural situations, but you should find ways to prepare them for any cross cultural situation. Metacognitive CQ is essential for this purpose and should be explicitly targeted in Air Force culture training.

Improving CQ through Metacognitive Training

Knowledge about culture is not enough for creating culturally adept Airmen. Metacognitive CQ serves an important role in cross cultural self-regulation and can help prepare Airmen to deal with a wide range of cultures by giving them the tools to adapt their behavior on the fly. But can Metacognitive CQ, or

metacognitive awareness in general, can be trained in the first place? As noted, experimental studies have shown that interventions that raise Metacognitive CQ can improve intercultural coordination and cooperation.³⁹ Studies already cited suggest that even simple awareness-raising interventions can raise Metacognitive CQ levels by prompting people to stop and reflect on cultural differences. Further, studies in domains other than culture (namely science) have shown that training targeting metacognitive awareness is effective, producing sustained gains – especially for low-aptitude students and when paired with discovery activities.^{40 41} Metacognitive CQ *can* be trained through carefully designed interventions, as will be shown below. However, the success of these interventions depends on a variety of factors.

Experience, Immersion, and Coaching

This value of experience and reflection in educational settings has been noted for many years. When it comes to raising Metacognitive CQ, experiential interventions are particularly effective. In a study featuring 62 undergraduate students, students who were given a lecture-only intervention exhibited lower improvements in CQ, whereas students who received lecture followed by an experiential component demonstrated higher CQ levels, irrespective of prior knowledge, skill or attitude.⁴² Coaching has also been suggested as an effective way of improving CQ, especially if it involves experiential learning that targets awareness-raising and perspective-taking; two critical components of metacognitive awareness.⁴³ In a qualitative meta-analysis of the CQ literature, Van der Horst and Albertyn recognize that coaching that incorporates Metacognitive CQ enables perspective-taking and improves cultural awareness. The authors note succinctly: “the literature on CQ increasingly recognises (sic) the importance of experiential approaches to development and learning in cross-cultural contexts.”⁴⁴

Variation in learning contexts also matters. Coached, experiential CQ learning provides students with an opportunity to apply new concepts in different settings and may therefore be more effective for helping Airmen apply what they are learning than simply providing information that raises students’ knowledge. Loewenstein, Thompson, and Gentner found that training must be combined with an opportunity to apply lesson principles to multiple situations.⁴⁵ This was demonstrated when participants in a treatment group were asked to compare two negotiation case studies, while a control group was exposed to each of the case studies separately. The act of comparing the case studies resulted in better transfer to a negotiation scenario than simply reviewing each case study separately. It should be noted, therefore, that all metacognitive training – experiential or otherwise – must provide for ample opportunity to apply Metacognitive CQ principles

in new settings. Simply reading about and inferring principles does not provide Airmen with an opportunity to practice their skills. Simulations or apprenticeships, rather than classroom lectures, are well-suited for this task.

Key Questions Revisited

Question 1: Is knowledge about culture enough to Raise CQ levels?

Put simply, the answer to this question is a resounding “no.” Training that only provides knowledge about specific cultures and about typologies of cultural differences merely raises Airmen’s Cognitive CQ levels. While this kind of knowledge is a necessary precursor to the other dimensions of CQ, it does not suffice on its own. After all, it is not possible to prepare students for every cultural contingency. The Air Force has generally trained Airmen in culture domains and provided details regarding specific cultures. If the Air Force wants to succeed in developing cross-culturally competent leaders, we must do more than provide this kind of information – we must do more than give people a knowledge-level awareness of culture. The Air force cannot train Airmen for all cross-cultural contingencies and should therefore prepare Airmen for any cross cultural situation. As shown in the literature, the key to unlocking this ability lies in Metacognitive CQ, not in Cognitive CQ alone.

Question 2: What aspects of CQ are most important for training that attempts to raise CQ?

Metacognitive CQ should be targeted in all culture training. Metacognitive CQ is where individuals plan, monitor, and revise their approach to cultural interactions. It is where culturally adaptive strategies are situated and used. The literature clearly shows that Metacognitive CQ confers great benefits in a variety of settings, improving idea-sharing⁴⁶, cross-cultural collaboration⁴⁷, and—crucially for the Air Force—cultural judgment and decision making.⁴⁸ Metacognition is the key to developing Airmen’s CQ levels and also yields the greatest gains in areas that matter to the service.

Question 3: What kinds of learning activities are ideally suited for raising Airmen’s CQ?

Experiential learning activities that vary contexts and prompt Airmen to reflect on their behavior are ideal. Learning is a complex phenomenon. It involves both cognitive, environmental, and social elements. Even so, the literature shows that inductive, experiential learning activities are ideal for developing metacognitive CQ.

Improving Metacognitive CQ – Potential Models

It is possible to improve Metacognitive CQ, but doing so requires effort and intentionality. Students are unlikely to experience incidental gains in this area. It has been noted that people are fundamentally ethnocentric in disposition and that interventions are necessary to overcome this orientation.⁴⁹ In other words, raising CQ doesn't happen naturally. The choice of intervention should be driven by a variety of factors. The duration, nature, and intensity of the multicultural roles Airmen are expected to perform shape the type of cultural skill required of an Airman. These are each important aspects to consider and each impact the choice of intervention. However, given the importance of Metacognitive CQ, emphasis should be given to those aspects of training that make people more self-aware, reflective, and self-regulated in multicultural settings, no matter what role the Airman will eventually fill. Such training will do more than provide information about culture; it will give Airmen the tools necessary to make adjustments to cross cultural interactions on the fly. The following models can help the Air Force facilitate this kind of learning.

Triandis' Culture Assimilators

One of the older DoD-sponsored CQ training programs is Triandis' culture assimilators. According to Triandis⁵⁰, CQ training should contain these two elements: suspending judgment (i.e. not acting until more information is available), and mentally attending to the situation, including its various cultural complexities. These elements are strongly metacognitive. Triandis suggests that suspending judgment and mentally attention can be improved using culture assimilators - training where students learn to interpret a situation in a way that the native of another culture would interpret it. Culture assimilator training was first developed by the University of Illinois on behalf of the US Navy.⁵¹ Culture assimilators contain scenario-based multiple choice tests. These multiple-choice tests offer a scenario featuring a cross-cultural disconnect between US culture and another culture. The choices in each question consist of three common (but incorrect) explanations for the situational disconnect, as well as a competing (but correct) explanation. The incorrect answers are responses that are often provided by Americans and represent common misconceptions. Correct answers result in extensive feedback about these areas of difference.

The effect of culture assimilator training is to make participants more adept at handling situations in specific culture pairs. While culture assimilators are not explicitly metacognitive in focus, this training does offer opportunities for self-reflection and implicitly promotes metacognitive awareness. As a multiple-choice

test, it can also be easily scaled. However, culture assimilator training is also limited because it only focused on specific culture dyads and because such training does not offer a metacognitive toolkit that can be readily applied to non-classroom settings. Further, assimilator training is not experiential in nature and does not provide students with an opportunity to practice what they have learned in real-world settings.

MacNab's Experiential Intervention

MacNab's experiential intervention is particularly promising in terms of developing Airmen's metacognitive awareness.⁵² The intervention involves seven stages of learning:

- In Stage 1, students receive declarative knowledge about cultural variance. This stage improves students Cognitive CQ by giving them a framework for understanding how cultures vary. In an Air Force setting, Airmen may be introduced to the 12 Dimensions of Culture or to Hofstede's dimensions at this juncture.
- In Stage 2, students receive instructions in which they are told to go out and design their own cross-cultural experience and to analyze this experience in terms of the framework introduced in Stage 1. This is a pre-reflection activity that promotes metacognitive regulation through planning.
- In Stage 3, a teacher provides students with feedback and coaching about their proposal, giving much-needed scaffolding and assistance.
- In Stage 4, students go out and actually engage in a cross-cultural experience of their own choosing.
- In Stage 5, students describe and reflect on this experience in terms of the framework they were given in Stage 1.
- Stage 6 involves more teacher feedback.
- Stage 7 allows Airmen to share the lessons they learned in a social setting with their peers through group discussion.

This model confers numerous advantages. The model works: a treatment group that used this method showed a statistically significant improvement in Metacognitive CQ among 743 international students in American and Australian universities. The intervention is also explicitly metacognitive and incorporates both cognitive and social learning theories; it provides coaching and personal reflection, as well as group learning. However, it also has significant drawbacks. For one thing, MacNab's intervention requires that learners design their own experiences. This

means that students will need to be relatively self-aware and mature to be successful. Secondly, the intervention is time-consuming, placing a constraint on its practicality. Lastly the Air Force also has restrictions that other cultural training organizations do not face: OPSEC considerations limit the degree to which Airmen can be encouraged to interact with others.

Despite these potential drawbacks, MacNab's experiential intervention's proven effectiveness warrants further consideration by the developers of Air Force culture training. The concerns listed above can be mitigated: A simulated inter-cultural space featuring DoD-vetted members of a target culture can mitigate OPSEC concerns by creating a safe space to practice cross-cultural interactions. Meanwhile, if an experiential intervention of this nature were incorporated into larger curricula, it could be carried out along with other training without taking up a lot of time on its own (say, during the course of a language learning program). Lastly, teacher-training can help overcome the difficulties faced by less mature students. If teachers are trained in administering cultural learning experiences, they can more effectively help even less mature Airmen design useful cultural experiences.

Cultural Cognitive Apprenticeships

Another useful model may involve adapting cognitive apprenticeships for the domain of culture. This model places students in the role of active participant in a learning community and scaffolds them toward learning critical skills using a combination of modeling, simulations, and coaching.⁵³ The main purpose of simulations is to approximate real-world cross-cultural situations as accurately as possible, while slowly withdrawing the support an instructor may offer. This prepares learners to transfer their cultural skills into the real world. It consists of five phases:

- Phase 1, during which instructors model real-life situations. In the case of CQ training, instructors may model real-life cross-cultural situations for the students – including the complications that arise from cultural differences. Student receive explicit instructions and are asked to reflect on the scenario.
- In Phase 2, Airmen simulate a real-world cross-cultural interactions and receive coaching from an instructor. There is no definite time associated with this stage and learning rates may vary from student to student.
- Phase 3 consists in a longer period of time in which Airmen continue to simulate such interactions and receive consistently reduced coaching and scaffolding, eventually becoming independently competent in multi-cultural settings.
- In Phase 4, students become self-directed Airmen and are able to apply the skills acquired on their own, including outside the classroom.

Cognitive apprenticeships confer several advantages: apprenticeships offer modeling in the confines of a sandboxed environment. Airmen learn to do a task or handle a problem before they encounter it in the real world, which has a low tolerance for error or risk – especially for Airmen. Secondly, the apprenticeship model also gives Airmen an opportunity to integrate practice with theory as they learn by giving them an opportunity to apply what they are learning in simulations. It is also more practical to simulate experiences in the classroom than to provide opportunities for immediate, real-world practice. However, there are also drawbacks to this approach: like other models suggest here, cognitive apprenticeships would require curriculum redesign for many institutions. An apprenticeship of this nature also requires a significant investment of time – the skills required to become a metacognitively aware cross-cultural expert do not emerge overnight. Instructors would have to be trained in CQ skills and given extensive preparation in ways to reduce scaffolding, as well as evaluating the cross-cultural simulations students design. Lastly, criteria would have to be established to determine when a learner has achieved the final phase of competence in the apprenticeship.

Measuring Outcomes

Various measures have been designed to assess individuals' CQ levels. The primary measure in the literature is the Cultural Intelligence Survey (CQS) designed by Van Dyne and Ang.⁵⁴ This measure assesses individuals' CQ based on the four-component framework, providing individual scores for cognitive, metacognitive, motivational, and behavioral components of CQ. Efforts to validate the CQS have been instrumental in validating the four-dimensional model of CQ. This scale enables program evaluators to assess the effects an intervention has had on various subcomponents of CQ, providing valuable data on where an intervention has been successful.

Alternative assessments that focus on individuals' use of CQ in simulated contexts have also been proposed.⁵⁵ These alternative measures would assess students in terms of their performance in real-world or simulated situations using a variety of task-based criteria. As an example, one might design task-based assessments where successful completion of an outcome depends on skillful use of CQ. Alternative assessments that replicate the circumstances in which Airmen are expected to negotiate cultural interactions are likely a good way to ensure transfer of learning for cultural skills. However, such tests are difficult to design, hard to validate, and don't lend themselves easily to quantitative analysis. Alternative assessments combined hold promise for future mixed-methods validation when combined with quantitative measurements like the CQS.

Conclusion & Future Directions

This literature review asked whether providing students with knowledge about specific cultures and about the way cultures differ enough to raise their cultural intelligence. The answer appears to be “no.” Such knowledge represents only the cognitive aspect of CQ and is not enough to improve Airmen’ overall CQ. When designing CQ training, the evidence suggests that using an approach that emphasizes metacognition is most beneficial, particularly when preparing Airmen who will work in frequently changing multicultural contexts. An intervention that focuses on Metacognitive CQ can prepare Airmen for a greater variety of cross-cultural interactions by teaching them to regulate their own cognition and to change their approach to cross-cultural interactions. While evidence seems to suggest that Metacognitive CQ can be raised, research must also examine the crucial role that personality factors play in the outcome of such interventions. Further cross-factor analysis using established psychometric scales, such as the Big Five, represent an as-yet unexplored area of research. The specific effects of Metacognitive CQ in applied, real-world settings would also be fruitful. The role of Metacognitive CQ’s role in successful second language acquisition also holds promise for future inquiry. The effects of training should be measured longitudinally to ensure that the intervention resulted in in positive transfer. Further study on the long-term effects of metacognitive awareness raising may also be fruitful, particularly when measured against the Air Force’s unique institutional requirements. □

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SMSgt Sergeant Benjamin Steel, USAF

SMSgt Steel is the Senior Enlisted Leader for the Information Exploitation Squadron at the National Air and Space Intelligence Center. In this role he leads a Squadron of military and civilian researchers in the Air Force's principal Open Source Intelligence Squadron. He is a career linguist and is proficient in German, Hebrew, Yiddish, Urdu, Hindi, Pashto and Punjabi. Sergeant Steel has a Bachelor of Arts in International Relations, Master of Arts in Translation and Interpreting and is working on an Education Doctorate.