Building the Best Offensive and Defensive Cyber Workforce

Volume I, Improving U.S. Air Force Training and Development

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ISSUE

The U.S. Air Force (USAF) has been looking for ways to revamp and improve the training and development of its cyberwarfare workforce to develop the best fighting force possible. As part of this effort, USAF expressed interest in better understanding the perspectives of the workforce, whose insights could inform further steps to improve training. Prior RAND work explored these issues among officers; this report focuses on the enlisted and civilian cyber workforces.

APPROACH

We conducted 30 focus groups and interviews to collect viewpoints of enlisted and civilian cyber personnel in offensive and defensive cyber operations—specifically, the cyber warfare operations (1B4) specialty, digital network analyst (1N4A) specialty, and civilians operating as part of the cyber mission force. We also talked to leadership at the bases we visited and subject-matter experts in cyber workforce training and development. The figure on the next page shows participants' viewpoints.
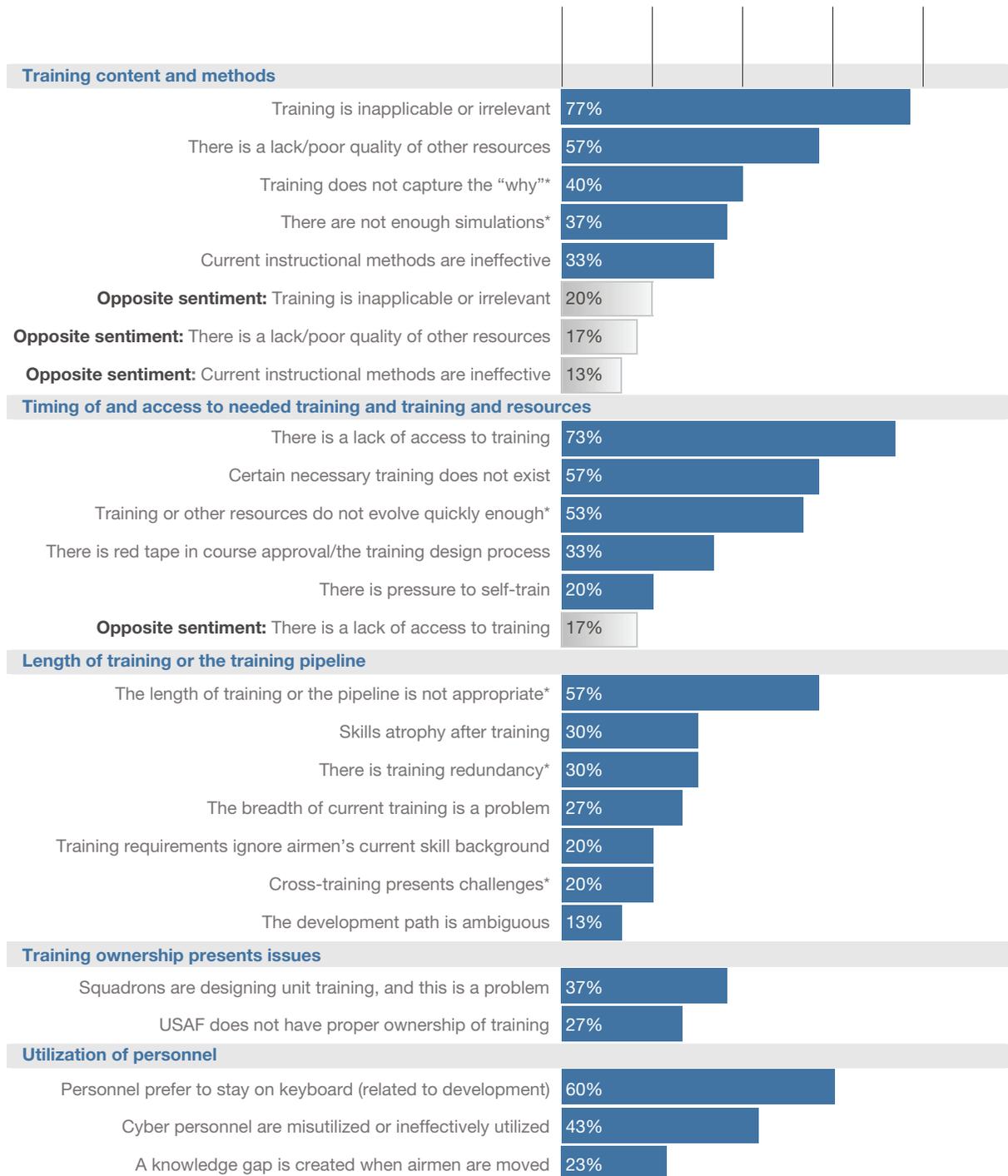
CONCLUSIONS

- Members of the cyber workforce and subject-matter experts acknowledged that there is room for improvement in training, and, according to some, major improvements are needed.
- Far more flexibility is needed in how cyber training is structured and delivered to ensure currency and to tailor training to the needs of the workforce.

RECOMMENDATIONS

We grouped our recommendations into two categories, shown in the table on p. 3.

SUMMARY OF TRAINING ISSUES RAISED BY PARTICIPANTS DURING FOCUS GROUP DISCUSSIONS

Training content and methods

Training is inapplicable or irrelevant	77%
There is a lack/poor quality of other resources	57%
Training does not capture the "why"*	40%
There are not enough simulations*	37%
Current instructional methods are ineffective	33%
Opposite sentiment: Training is inapplicable or irrelevant	20%
Opposite sentiment: There is a lack/poor quality of other resources	17%
Opposite sentiment: Current instructional methods are ineffective	13%

Timing of and access to needed training and training and resources

There is a lack of access to training	73%
Certain necessary training does not exist	57%
Training or other resources do not evolve quickly enough*	53%
There is red tape in course approval/the training design process	33%
There is pressure to self-train	20%
Opposite sentiment: There is a lack of access to training	17%

Length of training or the training pipeline

The length of training or the pipeline is not appropriate*	57%
Skills atrophy after training	30%
There is training redundancy*	30%
The breadth of current training is a problem	27%
Training requirements ignore airmen's current skill background	20%
Cross-training presents challenges*	20%
The development path is ambiguous	13%

Training ownership presents issues

Squadrons are designing unit training, and this is a problem	37%
USAF does not have proper ownership of training	27%

Utilization of personnel

Personnel prefer to stay on keyboard (related to development)	60%
Cyber personnel are misutilized or ineffectively utilized	43%
A knowledge gap is created when airmen are moved	23%

NOTE: We asked participants which aspects of training and development in their career fields needed to be improved and why. This figure details the variety of comments. Some focus groups had only one participant, meaning that they were essentially interviews. These interviews are included in the focus group results shown in this figure. When an *opposite sentiment* was expressed in more than 7 percent of the workforce discussions, it was added to the figure. Opposite sentiments are views that either run directly counter to the comments expressed by other participants or reflect someone noting or offering potential cons or downsides to a sentiment. Where an opposite sentiment was expressed in 3 to 7 percent of the workforce focus groups (i.e., one or two groups), the category is marked with an asterisk.

continued

RECOMMENDATIONS

Resource Changes	Structural and Cultural Changes
Would require additional human or monetary resources or shifting around of current resources • Develop and proliferate more training simulations and ranges. • Find new ways to test cyber capabilities using live red forces, but do so selectively. • Institute cyber aptitude screening. • Create an online forum for learning, information-sharing, and talent management. • Provide more structure and oversight of trainings developed by individual units.	May require resource changes but also require structural or cultural changes • Redesign training to be flexible and responsive to just-in-time needs and tailored to airmen's existing capabilities. • Create senior technical roles that are not management oriented. • Better educate the entire Air Force about what the cyber workforce does and how that work fits into the bigger USAF mission. • Hire and retain experienced instructors.

NOTE: *Live red forces* refers to live exercises that allow USAF personnel to practice engaging enemy forces by fighting against each other. The personnel engaging the enemy are *blue forces*; enemy forces are *red forces*.

PROJECT AIR FORCE