Designing Exercises for Teaching and Analysis

Center for Applied Strategic Learning

Exercises are designed for purposes that can generally be collapsed into two overarching goals: teaching or analysis. The goal of teaching is usually to make theoretical lessons concrete and convey some aspect of the demands that a student might face in applying them. When we use an exercise as an analytical tool, in contrast, we use it as a model that represents some real world problem or, better, class of problems and uses participant actions to generate information about how at least one of the elements of that model impacts decisionmaking. In this article, we discuss design process and examine the ways in which exercise *purpose* impacts its form, particularly its scale. Perhaps controversially, we also cast doubt on the analytical utility of large-scale exercises.

Design Choices

Games successfully used for teaching purposes appear to incorporate a number of factors. They are rich and detailed enough to excite and compel participants. They have many different functional roles for participants, giving them some representation of the experience of performing those duties, the more realistic the better. They accurately convey the complexity of the real world and require them to make responses to sudden developments, the more unexpected the better. The lessons that participants learn and are to apply to the real world have more to do with process than outcome and often simply underscore the difficulty of making choices in the thick of things.

The more specific and detailed the scenario or exercise, however, the more limited the conclusions that can be extrapolated from it to other problems or situations. If we are conducting an exercise to explore the contours of some ill-defined future problem, for instance, it is crucial that we be able to justify why we reach certain conclusions or how we generalize lessons learned from an exercise. Answering the "How do I know that I know that?" question is routine in the social sciences, including in qualitative work common in political science and sociology, but not always thoroughly discussed in the exercise design and evaluation community. Nevertheless, it is crucial to a defensible analysis.

An exercise that will be the basis of or contribute to an analytical study needs to incorporate features that allow investigators to generalize some findings and explain why their conclusions are not contingent on a random scenario detail or quirk of a particular participant. Here, then, parsimony trumps detail, and we are more interested in the smallest number of shared factors that might be causally related to outcomes and solutions to a problem. There is a variety of interesting work on the ways in which qualitatively specified games can be used analytically, ranging from being bundled together to validate formal mathematical models to serving as mechanisms for aggregating the expert knowledge of participants.

Key Differences

The elements of good exercise design for teaching and analysis can be somewhat different for the simple reason that the lessons to be learned are different. Analytically, what we learn from tabletop exercises usually has to do with whether the model of the problem described in the scenario introduces the right independent variables, whether others should be added, how they could be refined and their relative weight, and how differences in them might require different actions and result in different outcomes.

Exercises for teaching purposes are rooted in an assumption of the value of experiential learning, that giving participants a visceral feel for the exigencies of policy decisionmaking will be an effective way of making theoretical lessons they have learned concrete. For this reason, exercises are frequently used as capstones to courses, particularly at U.S. graduate military education institutes, and a single iteration of them more than suffices for teaching purposes, though problematic for an analytical exercise.

U.S. Air Force (Scott T. Sturkol)

American, Australian, and British airmen work together during Global Mobility Wargame at U.S. Air Force Expeditionary Center, Fort Dix, New Jersey

Each year the U.S. graduate military colleges collaborate to conduct a joint campaign planning exercise called the Joint Land, Aerospace, and Sea Simulation. A multiday, multimove exercise that requires a management team of some 50 faculty and professionals drawn from across the colleges and several governmental agencies, it offers over 100 students the opportunity to practice strategic level planning amid several simultaneous unfolding crises, posited to take place a decade in the future. Participants practice everything from speaking to the press to playing Cabinet-level officials. Plans are applied, revised, and critiqued at each move of the game. Observing the exercise, we see that an important lesson learned for students is the sheer amount of coordination that must occur and the extraordinary challenges of doing so, given all the important stakeholders and decisionmakers and synchronicity of events.

Large exercises encompassing a number of crises but only a single iteration are exactly the opposite of the structures necessary to doing more analytical work with them. The key to discussing conclusions is *reproducibility of findings* (observing the same thing over many iterations of an exercise) and *representativeness of sample* (how similar the participants are to the population of individuals who might be making decisions in the real world).

Tradeoffs

Most design choices make some tradeoffs. As we expand either the number of roles or the amount of scenario detail, the longer the exercise will need to be, both in terms of moves and total duration—and this is costly. Designers always make a compromise between the details that add real world fidelity to a scenario and layering so many that every choice and outcome is seen as contingent on something internal to the scenario, preventing lessons learned. The other way to characterize this tradeoff is one of generalizability versus representativeness. We can, roughly, either design an exercise that allows us to compare the impact of a few important characteristics to try and learn something empirically valid about a real world problem. Or we can create an environment so similar to a single real world problem that participants believe they are actually making decisions specifically about it.

The former approach is important to a design that allows serious analysis, while the latter approach can be a powerful teaching tool, similar to rehearsing a routine, if more interactive and dynamic, and can teach participants important skills such as negotiation, the function and impact of different roles, and how to make decisions in the face of stress and time limits. The biggest difference between

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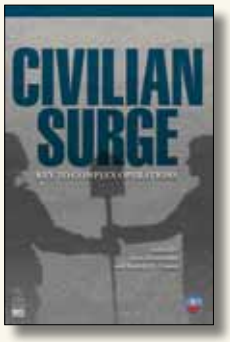

Civilian Surge: Key to Complex Operations
Edited by Hans Binnendijk and Patrick M. Cronin

The United States lacks adequate civilian capacity to conduct complex operations such as those in Afghanistan, Iraq, and New Orleans. Such operations require close civil-military planning and cooperation in stabilization and reconstruction, humanitarian and disaster relief, and irregular warfare and counterinsurgency. Only partial solutions to building civilian capacity have been offered thus far. With contributions from a team of National Defense University experts, this book presents a comprehensive review of all aspects of this national need. It concludes that current efforts to build sufficient civilian response capacity are unfinished and that the Obama administration needs to dedicate additional resources to complete the task.

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exercises for teaching and analytical purposes is that they weigh this tradeoff in opposite directions.

There is considerable risk in taking an exercise that has worked well for teaching and assuming that will be an effective basis for analysis because these tradeoffs cannot be wished away or blindly ignored. The large-scale exercises that abound in the security policy planning community are often ill suited to the task of analysis, whether for operational planning or strategic policy. For analytical purposes, we certainly need a representative sample of participants and a valid scenario, but, perhaps most importantly, multiple iterations of the exercise. A single iteration may not allow us to conclude much of anything about a problem, let alone its ideal solution, because it generates too small a sample.

Historians seldom fail to point out that the wargames run at the Naval War College in Newport during the 1920s and 1930s successfully predicted virtually every naval move used in the Pacific during World War II. The key was the sheer number of wargames conducted—some 300 in the interwar period. In contrast, the Millennium Challenge 2002 exercise, a major wargame conducted by U.S. Joint Forces Command to validate doctrinal changes, grew quite controversial after exercise designers found that one set of actions appeared overwhelmingly effective, and adjusted the exercise to minimize those factors.

Once designers have identified the topic of their qualitatively specified exercise or policy game, they must proceed to make some design choices. The goals of the exercise, primarily whether for teaching or analytical purposes, will drive design. At this stage, however, designers will be forced to make inevitable tradeoffs that are best addressed forthrightly in the discussion of the lessons to be learned. The methodology and process of designing a game for analytical purposes is similar to that of case study research, and a great deal of flexibility is engendered by the choice to do qualitative research. This choice, however, does not eliminate entirely the need to match methodology to conclusions. A little reflection on the purpose of the exercise yields benefits in terms of identifying the appropriate form. **JFQ**

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