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Future warfare, future skills, future professional military education

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Created in 1951 by Gen. Dwight D. Eisenhower to endow NATO Allies' officers with a forum for strategic education and politico-military reflection, this year the NATO Defense College is celebrating its 70th anniversary. In a world of rapid change and growing uncertainty, the best way to honor the past is to prepare for the future. This *Policy Brief* contributes to this goal by looking at the future of Professional Military Education (PME). Based on the recent Conference of Commandants,¹ the discussion is divided into three parts: what the future of warfare is, what skills future warfighters will need to possess, and how professional military education will have to change accordingly.

Drivers of change

To understand how future warfare will look, three major sources of disruption deserve attention: technology, demographics and climate change.

Technology. Technological change is not only enabling machines to operate way beyond human speed, but is affecting almost every area of activity. Technology is also spreading: not every country can build space shuttles, but some technological capabilities – like explosives, communication or computing – are becoming more and more widely available. At the same time, however, the spread of technology entails dependencies and, ultimately, vulnerabilities: from cyber to the security of supply chains. Technology is thus altering the balance of power, making some actors stronger, endowing others with relevant military capabilities and,

finally, increasing the risks for most.²

Demographics. Demographic trends are changing the composition of our societies, their internal dynamics as well as their mutual relations, directly and indirectly. The developed world is aging. In the West, immigrant communities generally have higher fertility rates. In other parts of the world, like China or Japan, where immigration is limited, the population growth curve is flat or flattening. The developing world, in contrast, is experiencing rapid population growth, which is predicted to continue further.³ Such growth is, however, difficult to handle because of a lack of infrastructure (healthcare, education, and communications) and structural weaknesses (like malnutrition and illiteracy). As a result, pressure on natural resources and on the borders with the developed world will inevitably increase: this will create security and integration challenges, not least because readiness to use force correlates with age.⁴

Climate change. Technological change and demographic growth promote economic growth. Economic growth

Keywords

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1 On 12-14 October 2021, the NDC co-organized the annual Conference of Commandants (of PME institutions) with the Royal Danish Defence College in Copenhagen.

2 H. Farrell and A. L. Newman, "Weaponized interdependence: how global economic networks shape state coercion", *International Security*, Vol.44, No.1, Winter 2019, pp.42-79.

3 S. N. Wahba Tadros *et al.*, *Demographic trends and urbanization*, Washington, DC, World Bank, 2021.

4 D. Jordan Brooks, S. G. Brooks, B. D. Greenhill and M. L. Haas, "The demographic transition theory of war: why young societies are conflict prone and old societies are the most peaceful", *International Security*, Vol.43, No.3, 2019, pp.53-95.

In a world where the spectrum of challenges is growing exponentially and decision-making times are becoming shortened at an equally rapid pace, so-called intelligent machines will be assigned a greater number of tasks and responsibilities to manage the sheer breadth and speed of the activities entailed

is, in turn, about transforming inputs (resources) into outputs (products). As societies grow in population and in wealth, they inevitably consume more resources.

However, the amount of resources in the world is finite. Not only are natural gas, oil, raw materials and natural resources (like fish) being consumed; the entire environment is becoming depleted, as pollution from human activities disrupts the natural cycles of the oceans and the atmosphere.⁵ This means that competition for natural resources will likely intensify. In some cases, the lack of natural resources will harm, or even halt, economic

growth. In other cases, such competition may result in confrontations, crises, and even conflict and war. Finally, since war may be about using or conquering territory, change in the natural environment may inherently affect who wages war, how and where: this explains, *inter alia*, the growing attention to the Arctic.

Future warfare

How is the interaction between technological developments, demographics and climate change affecting warfare? Given the inherent difficulty of predicting the future, here I delineate some trends that are already evident and that can reasonably be expected to continue further.

An acceleration towards “unpeace”. The growing importance of the electromagnetic spectrum, cyber warfare, and algorithms suggests that future wars will be waged, at least in some parts or phases, at an accelerating speed well above that of the human brain. Decision and reaction times will hence be compressed. This poses a set of dilemmas for traditional defense posture and force structure: should defenses be put, and kept, at higher alert levels, with the obvious risk of contributing to escalation, instability and even conflict? Similarly, will this growing speed ultimately blur the boundary between peace and war? Lucas Kello speaks of “unpeace”.⁶ Interestingly, this is what we observed in the past: it is thus possible that post-modern cyber and hybrid threats – as well as the role of non-state actors, from

terrorist to private military companies – could bring us back to premodern history.⁷

Contested, multidomain environments. Future military operations will be conducted in contested, multidomain environments. This means that access to the air, sea, cyber, space, and electromagnetic spectrum domains, far from being taken for granted, will not prove easy or constant. Technology spreads, and so do some of the anti-access technologies related to each of these domains. For this reason too, conflict will move seamlessly from one domain to the other as adversaries strike each other’s vulnerabilities or take advantage of their relative capabilities.⁸

Greater mix of conflicts. The variety of challenges, threats, theaters and actors points to different types of war in the future. In contrast to the recent past, where the essentials of ongoing or prospective wars tended to be seen in monochromatic terms (e.g., humanitarian interventions, counter-insurgency, war against terrorism, or great power competition), the years ahead will probably also bring wars based on combinations of these dynamics, in all likelihood complemented by others (like cyber war and ethnic wars).⁹

Future warfighters’ skills

What skills will future warfighters need to possess, in order to anticipate, prevent and eventually win future conflicts? Based on the possible evolution of warfare, three skills stand out.

Strategic judgement. In a world where the spectrum of challenges is growing exponentially and decision-making times are becoming shortened at an equally rapid pace, so-called intelligent machines will be assigned a greater number of tasks and responsibilities to manage the sheer breadth and speed of the activities entailed. In this context, the role of human beings will become *more*, not *less*, important: they will have to decide what to automate, how to automate, what data to look for, how to interpret predictive analytics and what decisions to take, including whether and how an entire business model needs to be changed.¹⁰ When war is waged at machine speed, from Carl Von Clausewitz’s emphasis on strategic genius we will need to transition to strategic judgement. This entails deriving strategic implications from technical, tactical and operational developments, and acting accordingly. For instance, human-machine interaction requires trust, and trust requires data. But

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7 J. Grygiel, “The primacy of premodern history”, *Security Studies*, Vol.22, No.1, 2013, pp.1-32.

8 S. Townsend, “Accelerating multi-domain operations: evolution of an idea”, *Military Review Online Exclusive*, August 2018.

9 L. Freedman, *The future of war: a history*, New York, Public Affairs, 2017.

10 A. Agrawal, J. Gans and A. Goldfarb, *Prediction machines: the simple economics of artificial intelligence*, Cambridge, Harvard Business School Press, 2018.