

Meeting defence officers' education needs

Institute marks 20 years of offering higher education that spurs broader thinking

Lim Min Zhang

More than 20 years ago, Singapore's defence officials realised the importance of "systems thinking" to tackle complex problems, by encouraging broader thinking beyond the silos of various disciplines.

The Temasek Defence Systems Institute (TDSI) was formed in 2001 to meet this need for higher education for defence officers – from military officers in combat roles to engineers and scientists.

The institute marked its 20th anniversary in July. More than 460 graduates from 18 cohorts have completed its flagship 18-month Master of Defence Technology and Systems course, including 72 international students.

TDSI director Yoon Soon Fatt

said its goal is to provide an educational platform that integrates three communities – military officers, defence engineers and defence scientists.

It also aims to provide a multi-disciplinary education that emphasises the integration of technology with operations, Professor Yoon said in an interview last week.

"You can have the best technology, the best gadgets and the best equipment, but if they are not integrated at the operations level, then it's not serving the purpose of why that technology was invented in the first place," he said.

For the flagship master's programme, students spend six months at the National University of Singapore (NUS), taking courses ranging from cyber security, artificial intelligence and data analytics, to probability and statistics.



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They then embark on a 12-month specialised curriculum at one of three partner institutions – the Naval Postgraduate School (NPS) or Air Force Institute of Technology in the United States, or Cranfield University in Britain.

Students are nominated and sponsored by their employers in the defence sectors, such as the Ministry of Defence, Defence Sci-

ence and Technology Agency (DSTA), DSO National Laboratories and ST Engineering.

They get two degrees when they complete the course – a Master of Science in Defence Technology and Systems from NUS, and a Master of Science in a specialised field from the partner institution.

Systems thinking is tested, for instance, in capstone projects. One

example, said Prof Yoon, 59, is developing the best way to combine manned and unmanned systems to defend a hypothetical island.

Students have to look at potential threats, and what weapon systems and components would be the most appropriate, while taking into account possible trade-offs.

Another consideration is the time horizon, said Mr Teo Tiat Leng, 54, director for capability development at the Systems Engineering and C3 Centre at DSTA, who was in the pioneer batch of the master's course at TDSI.

"In the case of island defence, you'll probably be thinking about how the threat will change over time, and would that render your defences irrelevant in a matter of years," he said. "(These are what) you start thinking about as a systems engineer, which may not be so apparent if you're strictly looking at this by the requirement to build a system and acquire a capability."

Working with military officers also meant he was more aware of

practical difficulties they may face.

Mr Teo cited an example of how, in foreign military officers' experience, the introduction of video teleconferencing in operations resulted in far more bandwidth being consumed than expected.

"Hence, there was a need to collect realistic usage patterns and plan the capacity with room for growth, and redesign or optimise ops processes to minimise what needed to be transmitted."

Another TDSI alumnus, Mr Mike Lee Kum Leong, 39, is a senior defence researcher in the emerging systems division at DSO.

He said that although he was in the applied physics stream during his stint at NPS, his professor would take the class for other talks at the nearby Stanford University.

"So it's not really like what the name says – Naval Postgraduate School – they are very open to a lot of technologies, even in the space (field)," he added.

mzlim@sph.com.sg