



Cultivating Joint Talent: PLA Education and Training Reforms

by Kevin McCauley

KEY TAKEAWAYS

- Cultivating joint command talent and promoting realistic and complex joint training at the campaign and tactical levels is critical to the successful implementation of integrated joint operations, transformation efforts, and enhancing the People's Liberation Army's [PLA] overall combat capabilities. The PLA is implementing a "Triad" military education program to address problems with joint talent and training.
- The implications for the PLA of successful implementation of joint talent cultivation and improving joint training are significant for reaching its goal of an advanced military. While the PLA's transformation will likely be a lengthy process, the PLA can still present a lethal opponent with its precision long-range strike and information warfare capabilities.
- The PLA's modernization effort faces the complex task of integrating mechanized warfare, informationized warfare, and intelligent warfare systems and operational methods into the force concurrently. Reported difficulties educating officers and staff for informationized warfare raise questions about the PLA's ability to integrate fully intelligent warfare technologies and operational methods into the force.

INTRODUCTION

This is an updated version of a paper presented at the Carlisle PLA Conference in October 2018 hosted by the US Army War College, National Bureau of Asian Research, National Defense University, and the US Indo-Pacific Command. The US Army War College published an abbreviated version of the paper as a chapter in the book "The People in the PLA 2.0" available at <https://press.armywarcollege.edu/monographs/944/>

This paper examines the PLA's reforms targeting the development of joint commanders and staff, and efforts to improve joint training. Qualified joint officers and a well-trained joint force are fundamental requirements to propel the PLA into the echelons of the world's advanced militaries. The PLA's military

Authors

Kevin McCauley is a retired analyst who served as senior intelligence officer for the Soviet Union, Russia, China, and Taiwan during 31 years in the federal government, as well as a former Adjunct at the RAND Corporation. He served on numerous advisory boards and working groups supporting the Intelligence Community, National Intelligence Council, and U.S. Indo-Pacific Command. He currently writes on China and Taiwan military affairs for the U.S. Government and various think tanks.

education reform effort is to improve the quality of personnel in general, but an important emphasis of the current military educational reforms is focused on joint commanders and staff. The PLA intends to instill a general level of joint knowledge throughout the entire military as it pushes joint operations capabilities down to the tactical level. While the detailed outline of these reforms is known, the full extent and quality of implemented reforms are difficult to gauge.

The operationalization of an integrated joint operations capability is placing new and complex requirements on joint commanders and staff as well as on unit training. The “Science of Strategy [战略学]” published in 2020 adds multi-domain to integrated joint operations.¹ The PLA is implementing the Triad military education program reforming military educational institutions and the joint curriculum to develop quality joint operations talent. The Triad system incorporates three components: military academy education; military professional education; and unit training practice. The three components are not new, but the current reform is attempting to update and integrate the elements into a holistic system of systems that would create a synergistic effect between the components to cultivate the joint talents required for the PLA’s transformation. Importantly, the PLA intends to closely integrate military academic institutions with unit training, believing that the interaction will benefit both areas.

The PLA intends to improve joint training through realistic, actual combat conditions to compensate for a lack of combat experience. An essential element to improve joint training reforms is standardizing a quality unit training assessment and evaluation system. The PLA is reportedly expanding simulation/wargaming

centers and Battle Labs. These facilities can provide economical training of joint commanders and staff, as well as experimentation and innovation in operational methods.

The implications for the PLA of successful implementation of joint education and training reforms are significant in its efforts to enter the ranks of the world’s advanced militaries. The PLA believes developing a large contingent of joint commanders and staff will take time. However, the incremental improvement and expansion of joint talents should enable the gradual implementation of a multi-domain integrated joint operations capability leading to increased combat effectiveness. Even though the transformation process will likely be long, the PLA can still present a lethal opponent, for example with its long-range precision strike and information warfare capabilities. This would especially be true against countries with armed forces at an equal development stage or less advanced than the PLA. The PLA would have to rely on conducting joint coordinated operations rather than a fully developed advanced form of joint combat, which could work well in smaller, shorter conflicts. However, the PLA could face increasing difficulties in joint command and coordination during a longer dynamic conflict against an advanced military.

INTEGRATED JOINT OPERATION REQUIREMENTS

President Xi Jinping’s current reform effort in part has prioritized implementing the key twin capabilities of integrated joint, and system of systems operations. These theoretical concepts impose new joint requirements on commanders and staff, necessitating the PLA’s emphasis on

cultivating joint talent and improving joint training. These joint command requirements include decentralized command, complex coordination, the employment of joint modular task forces, employment of modern informationized weapons systems and equipment, executing joint tactical actions, and creating new innovative operational concepts. The addition of multi-domain to integrated joint operations highlights the PLA's intent to engage an opponent on land, maritime, air, space, network, electromagnetic, intelligence and other domains under a unified plan.

The successful implementation of integrated joint, and system of systems operations will require an elevated level of joint command and staff skills, as well as realistic joint training to operationalize new joint concepts. The future operations the PLA envisions will place great stress on joint commanders and their staffs at all echelons to control and coordinate forces dispersed across a vast battlespace conducting complex operations. These operations require a high-level of integration of forces, reconnaissance and intelligence, and weapons systems. The requirement for a rapid sensor-to-shooter timeline places a burden on the observe, orient, decide and act [OODA] loop for rapid information transmission, analysis and decision making on a fast-paced battlefield. The restructuring of task force groupings during an operation will require extensive practice during exercises. New integrated joint command systems require greater high-tech skills, computer literacy, and training on the new systems than in the past. The developing joint tactics and joint tactical force groupings will also require joint skills and training down to the tactical level.

PLA IDENTIFIED PROBLEMS RELATED TO JOINT TALENT DEVELOPMENT

The PLA has identified numerous, significant problem areas in cultivating joint talent. President Xi has stated the development of joint command personnel is an urgent priority to address the shortage of qualified personnel. In 2018, the PLA continued to view the overall quality of officers and men at all echelons as inadequate, especially joint commanders and staff. The PLA believes military education needs additional resources to develop the specialized skills in core competencies; and the personnel evaluation and selection process require improvements to correct significant problems, as evidenced by press reporting on PLA corruption cases related to promotions and recruitment.²

Identified problems in the military educational institutions include the following: instructors that are out of touch with modern operational concepts and outdated courses; poor discipline and management; lack of innovation; fraud and corruption polluting the academic environment as well as diverting funds and resources; the need for improved regulations on joint military education and training; poor coordination between military academic institutions and units; lack of adequate funding for military education; difficulty arranging research exercises; and a requirement for top level design providing high-level holistic planning and management of military education reforms.³ The Central Military Commission's [CMC] Training and Administration Department [TAD] in June 2018 continued to report violations in the military educational system involving teaching and management problems.⁴ Significantly, President Xi has accused the military academic institutions of the "four winds [四风]," namely formalism,

bureaucracy, hedonism and waste. He believes reforms will be a difficult struggle that must be won.⁵

The PLA uses the slogan translated as the “five incapables [五个不会]” to describe command deficiencies in some officers. The five problem areas are as follows: not accurately assessing the situation; not understanding the superior’s intent; not making accurate combat determinations; not properly deploying troops; and not adequately dealing with emergencies.⁶ Improved command and staff education, training, and job certification are some of the proposed solutions to overcome these deficiencies.

Military reform efforts emphasize improvements in training, especially joint training, to approach actual combat conditions. The requirement for actual combat training is to overcome the lack of recent PLA combat experience and a peacetime mentality permeating the force. The PLA has identified the following areas of training requiring improvement: continuing upgrades to large training bases, simulation centers, and Battle Labs to support joint training and experimentation; a focus on rigorous and complex joint training; opposing force training to increase realism; training focused on unit wartime missions; eliminating an indifference to realistic training and fear of accidents that limits training intensity; and standardization of evaluation methods to eliminate falsification of training results to accurately gauge unit combat capabilities.⁷

A PLA Daily article from November 2017 highlighted many of the problems and proposed fixes to develop joint talents. Essentially, the teaching system is considered inadequate requiring reforms to develop high quality joint operations personnel. Teaching needs to address

joint staff professional and position requirements, highlight informationization, establish innovative teaching methods, create a quality and specialized level-by-level teaching curriculum, improve operational planning capabilities, and establish a joint staff training textbook system as soon as possible.⁸ Some of these proposals are addressed in the new reforms.

The CMC’s TAD and Discipline Inspection Commission found 28 military training violations in early 2017. Units and personnel in the Army, Navy, Air Force and Rocket Force were disciplined for varying degrees for training violations.⁹ The TAD held a meeting in July 2018 of the theater commands, the services and branches, the People’s Armed Police, and relevant CMC departments. identifying three major impediments to realistic combat training. The problems were related to unhealthy habits accumulated during peacetime including the lack of realism in combat training, the “five incapables” related to command training, developing strong and innovative base training areas; construction of key training projects; deepening civil-military integration; and building a support system covering all services and branches for linked training.¹⁰

JOINT EXERCISE EXPERIENCE

The PLA has conducted increasingly complex joint exercises over the past two decades. These exercises have included the establishment of task organized campaign and tactical joint formations providing joint experience to operational and tactical commanders. The CMC tasked the former Jinan Military Region [MR] with conducting experimental joint training during the first decade of this century. This joint training likely built up a group of commanders and staff with some working

knowledge of the problems and requirements of complex joint operations and coordination with other services based on this joint exercise experience.¹¹

BACKGROUND ON PLA EFFORTS TO CULTIVATE JOINT TALENT

The PLA has researched the education and training of joint operations officers beginning as early as the mid-1980s with increasing focus since the 1990's. The PLA's analysis concludes that new quality military talents will play an increasingly important and decisive role on battlefield dominated by information and intelligent technologies. The PLA also assesses military personnel lack required skills in integrated joint operations and informationized warfare. The current military educational reforms emphasize joint operations and information technology to address these problem areas. Importantly, the PLA continues to believe that while technology is critical for combat capabilities, humans are the decisive factor for victory on the battlefield, reinforcing the importance of developing quality joint personnel.¹²

The PLA considers the military education system as having gone through three major stages. The first stage was the establishment of a formal military educational institutional system from the inception of the People's Republic of China in 1949 until the end of the 1970s. The second stage established the cultivation of high-quality military personnel from the 1980s until the end of the 20th century. The third stage has exhibited the maturation of the military educational system since the beginning of the 21st century, focused on vocational education [任职教育] with an established division of responsibility, the beginning

of individual educational systems for the various services and branches, and joint service and branch training.¹³

Over the past two decades, the PLA has focused on improvements to professional military education. The PLA views improving military education as providing a foundation for military modernization, forming a pool of high-quality military talent, and preparing for combat. As early as 2001, the PLA began to focus on developing joint operations command talent [联合作战指挥人才], recognizing the deficiency in quality and quantity of joint command officers and staff. The reform effort is designed to develop joint command talent and cultivate officers proficient in organizing and implementing joint operations under conditions of informationization. As part of the plan to develop joint command talent, the PLA began cross-training [交叉培训] officers in the command colleges to improve their knowledge of the different services.¹⁴

In August 2003, the CMC issued the twenty-year Strategic Project for Military Talent [军队人才战略工程]. The project's objective is to build up a contingent of command officers capable of planning and directing informationized wars; build an informationized armed forces; establish a contingent of scientists capable of planning and innovating the development of informationized weapons and equipment, as well as research key technologies; build a contingent of technical specialists knowledgeable of new and high-tech weapons and equipment; and build a contingent of noncommissioned officers [NCO] capable of operating and maintaining informationized weapons and equipment. The plan's objective by the end of 2010 was to increase the quality and quantity of well-educated military personnel and by 2020 to make a significant leap in the education

and training of quality military personnel.¹⁵

The PLA issued two documents covering the period from 2000 to 2020 to cultivate military talent. The CMC in 2000 released the “Central Military Commission Outline on the Reform and Development of Military University and College Education [2000-2010]” [中央军委关于军队院校教育改革发展纲要 [2000-2010年]] to build and improve the military university and college education system of systems. In 2012 the CMC issued the “Outline on Military University and College Education Reform and Development Plan before 2020” [2020年前军队院校教育改革发展规划纲要] to realize an informationized and innovative education system to develop quality personnel and enhance combat effectiveness.¹⁶ President Xi’s military reform effort announced at the Third Plenary Session of the 18th Communist Party of China [CPC] Central Committee in November 2013 also emphasized the need to reform military colleges as well as improve joint unit training.¹⁷ However, as of 2017, the PLA still considered basic research on joint education of military personnel to be relatively weak.¹⁸

In October 2008, the CMC released four documents to improve the training of joint operations command talent and reform the military academic institutions. The four documents were as follows: “Measures to Further Promote the Cultivation of Joint Operations Command Talent” [关于深入推进联合作战指挥人才培养的措施], “Joint Operations Command Talent Core Quality and Capability Training Model [Trial]” [联合作战指挥人才核心素质能力培养模型[试行]], “Opinion on the Implementation of Military University and College Instructor System” [关于军队院校实行教官制的实施意见] and “Opinion on Strengthening Military University and College Joint Operations Teaching Material Construction” [加强军队院校

联合作战教材建设的意见]. The CMC intended the four documents to correct problems with joint education identified in a seminar held that year. The effort attempted to increase joint training, develop joint operations course materials and teaching staff, implement joint professional training, integrate military colleges and unit training, encourage innovation in teaching and training, and improve the assessment and evaluation system.¹⁹

The former General Staff Department issued in 2012 the “Joint Operations Command Talent Cultivation Research” [联合作战指挥人才培养研究], the “Joint Operations Command Talent Core Quality Capability Training Model [Trial]” [联合作战指挥人才核心素质能力培养模型[试行]], and “Measures for Deepening the Cultivation of Joint Operations Command Talent” [关于深入推进联合作战指挥人才培养的措施]. These documents clarified and standardized the content and methods for training joint operations command talent in the informationized era.²⁰

In early 2016 the CMC issued “Opinion on Deepening National Defense and Military Reform” [关于深化国防和军队改革的意见] stating that the PLA would complete the current reforms between 2017 and the end of 2020. The key reform effort is the “Triad²¹ New Military Personnel Education System of Systems [三位一体新型军事人才培养体系]” composed of the three programs developing military university and college education, unit training practice, and professional military education. The new education system of systems attempts to integrate military educational institutions and unit education and training to provide cross-fertilization and innovation based on war fighting requirements. The leadership established a two-tier university and college leadership management system comprising the

CMC and the service headquarters. The “Opinion” also adjusted and optimized the scale and structure of the military education institutions as well as continuing military-civilian integration [军民融合]²² to support the improvement of military education.²³ As part of the reforms, the PLA has downsized and reorganized the military academic institutions, with 37 PLA and 6 PAP organizations remaining.

In 2019, the CMC established the Talent Work Leading Group to provide a top-level coordination mechanism to achieve a historical leap in promoting military talent. The goal is to cultivate high-quality new-type military talent on an extensive scale as a strategic requirement for strengthening the military in the new era.

In January 2021, the CMC issued the “Interim Provisions on the Education and Training of Officers on Active Duty” [现役军官教育培训暂行规定] implementing the military education policy in the new era advancing the reform and innovation of officer education and training to accelerate the establishment of a contingent of high-quality and professional officers within the Triad reform system.²⁴

In the past two decades, the PLA has initiated reforms and issued documents intended to improve military education and training with a focus on joint operations talent and training. However, President Xi and the PLA’s identification of continuing problems in these areas indicates that past reform efforts have had limited results to date.

Cross-Training

Cross-training is an additional method employed by the PLA to improve joint knowledge. In 2001 the PLA implemented cross-rotational training

to expand knowledge of the various services and arms, and in 2003 the system of cross-service and arms appointments was implemented to enhance the training of joint operations command talent. The 2004 defense white paper in the section on the strategic project for talent discussed cross-training as a method to cultivate high-caliber joint talent.²⁵

A well-documented effort in cross-training occurred in the former Shenyang MR. This MR created a “New Military Talent Nurturing Coordination Zone” to improve joint operations command talent, break down service-centric thinking, and improve the combined-arms knowledge of its officers. The initiative coordinated with 18 units in the MR, including the three services, the former Second Artillery Force, and local and military colleges. This Coordination Zone established a “Talent Building Guidance Commission” and a “Talent Building Research Department” composed of experts and scholars to assist the effort. Cross-training, assignments to other service units and attendance in other service academies were employed to develop talent. The MR’s cross-training effort included the following:²⁶

- 200 officers conducted cross-college training.
 - » 30 ground force officers at division and regiment level spent a month at the Navy Command College, the Air Force Command College, or the former Second Artillery Command College
- 100 officers served in another service.
- 87% of “primary commanders’ had cross-training experiences
- Establishment of a joint MR-National University of Defense Technology high-tech training base for officers at division and regiment

- Establishment of an Engineering Master's class at Northeast University and Dalian Institute of Technology for command personnel
- Organization of a training class at the former Shijiazhuang Army Command College to prepare regiment and battalion officers for joint operations command.
- 10,000 officers at regiment and below exchanged positions within their service for combined-arms experience.
- 63 officers at regiment and above studied or visited foreign countries.
- 200 officers participated in peace keeping operations or acted as military observers.

While the extent of this method to provide joint experience is not clear, cross-service training is continuing, with recent reports of officers assigned to other services. Graduating students from a service university or college are reportedly being sent to serve in different services. An example is a student from the Army Engineering University, one from the Army Service College, and a student from the Strategic Support Force Information Engineering University sent to an Eastern Theater Air Force brigade. The National Defense University's Joint Operations College has sent more than 10 personnel to various services to exchange positions to gain joint experience. Cross-service training appears to be particularly active between the Army and Air Force promoting ground-air integration.²⁷

Training Terminology

Military talent joint education refers to implementing joint quality education [联合素质教育], joint professional education [联合职业教育], and joint coordinated education [联合协同教育] to cultivate joint military personnel

at all levels. The PLA believes it important not only to focus on joint commanders and staffs, but to popularize and improve joint operations understanding and education at all levels of the military. All military academic institutions should support popularizing joint operations and information technologies. Several educational concepts PLA publications discuss as part of joint reforms of military education institutions include the following:²⁸

- **Joint Quality Education's** [联合素质教育] primary goal in developing and improving the basic quality of personnel includes cultivating a person's intelligence, morality, physical health and other characteristics.
- **Joint Professional Education** [联合职业教育] imparts the necessary professional knowledge, practical skills, and ethics required for a specific occupation.
- **Military Vocational Education** [军队院校任职教育] involves military educational institutes providing officers the required knowledge for competency in their post.
- **Joint Coordinated Education** [联合协同教育] is based on the joint teaching and training [联教联训] system creating an interconnection and interaction between different educational systems resulting in a synergy that enhances the entire educational system for the joint cultivation of personnel.
- **Joint Teaching and Training** [联教联训] is teaching and training activities jointly organized and implemented by military academic institutions and units to promote the integration of military academic institutions and units for mutual benefit.

- **Centralized Academic Education and Decentralized Vocational Education** [学历教育合训、任职训练分流 abbreviated as 合训分流] where military academic institutions recruit high school graduates or soldiers to complete undergraduate education, as well as military and political basic training. Afterwards they transfer to a vocational education institute for command specialized training.
- **Distance Education** [远程教育] using networks, radio, television, and other means to provide continuing, on-demand education.
- **Cross-Training** [交叉培训] program employed to meet the demand for joint operations talents by assigning personnel to other services, branches, or academic institutions to gain interdisciplinary and joint experience.

KEY INSTITUTIONS DEVELOPING JOINT TALENT

National Defense University

The 2004 Defense White Paper described basic command colleges providing joint operations basic training, intermediate command colleges providing combined arms training, and advanced command colleges providing strategic research and joint campaign training. The National Defense University [NDU] includes a wargaming building to conduct strategic confrontation exercises with students.²⁹ The PLA considers the NDU as the one joint military school, although the National University of Defense Technology and service colleges provide joint teaching and training content.

The NDU provides joint command education and includes the Joint Operations College and the Joint Service College. The Joint Operations College sends experts to field training to provide guidance.

In 2008, NDU held a meeting with intermediate and senior vocational educational and academic institutions on improving joint operations command talent. The meeting established a teaching cooperation group and a research cooperation group to form a joint teaching and training mechanism. The NDU established an “All Army Joint Operations Knowledge Learning Network Training Platform” [全军联合作战知识学习网络培训平台] and a “Joint Operations Command Talents Network Education Platform” [联合作战指挥人才网络教育平台] to promote online training by the entire military. The platforms offer an open and collaborative environment with a variety of educational programs to meet the differing requirements of military personnel. *The PLA Daily* has reported units using the “All Army” platform.³⁰

The NDU has initiated several efforts to improve joint education. In 2013, the university began examining teaching reforms, scientific research innovation, team building, and strict education management. In September 2014, the 44th joint command class included six new disciplines added to the curriculum related to joint operations. In the spring of 2016, the 46th commander class began a one-year program divided into two majors: joint operations command; and leadership management and command. The NDU has constructed 14 new training facilities, including a Joint Battle Lab [联合作战实验室] with a wargaming system for confrontation exercises. NDU also organizes training in other command colleges, at training bases and conducts a “famous teacher” [名师工程] project to bring in instructors with unit experience and dispatch professors to units, as well as providing opportunities for study abroad and conducting research projects to improve the teaching staff.³¹

The NDU has begun graduating officers trained in joint programs. In August 2017, the PLA announced that NDU had trained more than 1000 joint operations commanders in the past five years. The PLA in August 2018 announced the graduation of the first phase of the joint post qualification training course. The PLA's joint operations command track is designed to address problems in joint operations and joint operations command development. The course includes all-domain joint operations, informationized local war, national defense economy, and preparation for military struggle. Nearly 200 students passed the graduation assessment with qualification certificates. The program is based on a new joint operations talent training system. The training began in October 2017 and lasted nine months, with a second class in April 2018. NDU planned to identify problem areas for further refinement of the system. The NDU plans to hold the new joint course once or twice a year. The NDU selects students from the CMC organizations, theater commands, the services, and division, brigade, regiment, and battalion level units.³²

The NDU's current joint operations command training program is aligned with the new joint operations outline issued by the CMC and is fully integrated with the theater joint operations command system. NDU adjustments include a focus on training joint command talent for new forms of war, teaching reforms, and a revamped curriculum of eleven joint courses, including "Theater Joint Operations Command," "Foreign Army Operations," "Joint Operations Guidelines," and "Joint Air Defense Operations." The NDU is embedding students in theater joint command positions and participating in command post exercises to prepare them for command.³³

A recent PLA Daily article stressed the importance of NDU's Joint Operations College in cultivating joint operations command personnel while noting the need to update teaching concepts, optimize courses, and improve teaching models. The article went on to state that since 2020 more than 98% of joint commanders and staff of major joint exercises have been trained at the college, and more than 100 young and middle-aged instructors at the college were embedded as joint commanders in exercises. However, the article went on to admit that most officers at all echelons are not proficient in joint command and lack combat experience. The college is continuing efforts to improve joint educational reforms through establishing a new curriculum system, and training standards, and improving the faculty. Instructors are reportedly feeling overwhelmed by the new teaching requirements.³⁴

National University of Defense Technology

The National University of Defense Technology [NUDT] provides joint support courses, including six specialty tracks and 14 joint operations support courses. The NUDT provides technical support for the military professional education platform.³⁵ President Xi identified senior officers as having limited knowledge of high-tech systems, even though they command units equipped with modern equipment. This resulted in NUDT assuming a role in officer training to address the lack of scientific and technological competency.³⁶ It appears that NUDT is important in supporting reforms to develop joint talents. With its faculty's expertise in science and technology, the NUDT is likely well positioned to play a key role in educational reforms and operational innovations as these are influenced by technological developments such as information technologies and artificial intelligence.

Theater Commands

The theater commands created in 2016 represent new joint command organizations replacing the PLA Army-dominated Military Regions. The Army-centric MRs failed to develop officers experienced in joint operations and jointness between the services. Subordinate to the CMC's joint operations command center, the theaters' joint operations command center is the primary organization for commanding operations in their theater's strategic direction. The joint theater commands conduct joint training based on theater missions and command joint operations in wartime or during non-war operations. Theaters play a role in developing and administering joint command personnel qualification assessments.³⁷

Service personnel assigned to the newly established theater commands demonstrated unfamiliarity with joint operations and joint command. President Xi visited the Southern Theater Command in October 2018 observing weak command capabilities amongst personnel including knowledge of the command information system and joint training. Although selection for theater commands requires a minimum of two years headquarter experience at or above the group army-level as well as participation in large scale joint exercises, officers were not prepared for joint staff duty. At their establishment, the theaters formulated a three-year program to train a contingent of competent joint operations command personnel. Joint operations command center exercises have also provided experience in joint command and coordination of forces. The lack of reported problems at the theater level in 2021 could indicate that theater joint staff quality is improving.³⁸

Some efforts at systematizing joint talent development are evident, although there appears to be a lack of uniformity as each theater develops its own program. The theaters are developing joint command procedures governing various command levels, area specific requirements, level-by-level and skip echelon command procedures, and specific responsibilities for the theater and subordinate service commands. The theater command's party committee appears to be developing joint operating regulations and procedures based on CMC guidance.³⁹

TRIAD SYSTEM MILITARY EDUCATIONAL REFORM

PLA transformation plans have included the strategic priority to reform military academic institutions reform throughout the 21st Century. President Xi stressed the need to accelerate the construction of the new Triad reform to strengthen the training of joint operations command talents identified as a strategic resource.⁴⁰ The Triad reform also represents the PLA's desire to better integrate educational and unit training programs to create new synergies, share resources, and cross-fertilize innovation and knowledge. Importantly, the reform represents the integration of military education and unit training. The Triad reform includes three components: military academy education, unit training practice and military professional education. While the three programs of the Triad reform are not new, the system represents an attempt to improve and integrate the education and training system to better support the cultivation of military talents in general, and joint talent specifically.

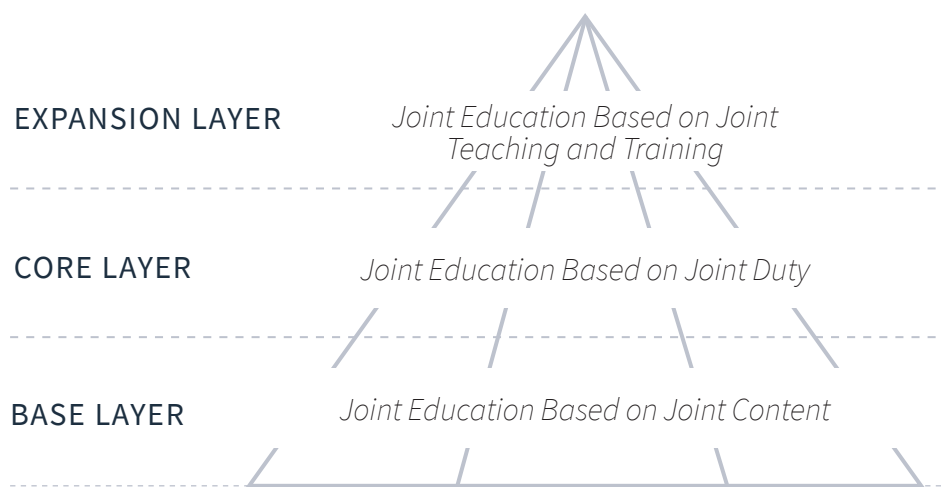
The following documents provide centralized support for the Triad program: the "Outline for

College Education Teaching” [院校教育教学大纲] provides an overall plan and requirements for military university and college education; “Outline for Unit Training Practice” [部队训练实践大纲] provides integrated requirements and evaluation for military unit training; and “Outline for Military Professional Study” [军事职业学习大纲] provides planning and requirements for professional education programs.⁴¹

The Triad reform promotes an informationized educational environment to expand and effectively cultivate military talent. The PLA assesses that joint

education and training should cover the entire force. The PLA estimates that basic research on joint education remains relatively weak with no new clear concept of joint education. The CMC continues to evaluate the Triad reform and make revisions as needed. The PLA also realizes that the growth of joint talents is a gradual, incremental process, with joint training progressing from branch to service to joint exercises. The PLA is studying US and Russian joint education as well as other militaries for inspiration.⁴²

Figure 1: Basic Model for Joint Talent Development



Military educational institutions are making some progress, but problems continue with outdated policies remaining, a weak linkage between military colleges and unit training, inadequate unit training, waste and lack of resources, and an underdeveloped joint education system. The PLA leadership believes it must break the traditional mindset to achieve successful implementation of a long-term reform plan for developing joint talent throughout an entire military career. Necessary elements to fully implement the Triad system include a unified

leadership guidance, uniform implementation, a resolution of inter-departmental problems, and integration of education and training across the military.⁴³ The past PLA goal to complete educational reforms by the end of 2020 was not met although there are indications of some progress. The 2020 goal may have only addressed the downsizing and reorganization of the military educational institutions which has occurred.

In early 2021 the CMC issued a series of regulations on a new officer system addressing management, evaluations, promotions, and

related matters to career development. These regulations are intended to strengthen the officer corps. The regulations are devised to support the Triad reforms promoting military talent education and training, as well as aligning the reforms to officer career development and promotion focusing on command and management capabilities.⁴⁴

Military Academy Education

“Military academy education [军队院校教育]” is the primary educational means to improve the quality of military personnel, teaching basic knowledge and skills as well as an advanced military curriculum. Military academic institutions need to promote innovative minds and thinking abilities, laying the foundation for long term talent development. The PLA intends to standardize military academic education through the “three-tier, four-level [三层四级]” standards for command officers, standardization of the teaching outline and talent training program, class standards, and other education system specifications.⁴⁵

The PLA wants instructors to have strong understanding of military theory as well as practical military experience. PLA publications discuss a regular rotation system based on their examination of the US Army West Point Military Academy, where instructors rotate from units to teach at the academy. The intention is to create “teacher-expert-commander” type of faculty to enable students to access high-end knowledge. This system would allow military educational institutions to better incorporate unit training requirements into courses.⁴⁶

Keys to successful implementation of reforms in military academy education include construction of a quality military faculty, an evaluation program to gauge the quality of military education, establish rigorous requirements and evaluation of joint

personnel, and strict high-level management of military education to guide the reforms. Military educational institutions are reportedly developing new courses while canceling those that are outdated. The NDU has reportedly redesigned graduate courses including a “Modern Warfare and New Military Reform” course, as part of the educational changes featuring small classrooms taught by expert instructors using upgraded teaching resources. The new course has a teaching team of 18 experts and features modular options to customize the course to students’ personal needs. The Naval Engineering University is revamping its courses to integrate information and intelligent technologies. Big data engineering and artificial intelligence are examples of newly established courses in addition to the use of experimental platforms and artificial intelligence laboratories. Other subjects introduced to improve scientific and technological literacy of officers include hypersonic and quantum technologies, and cognitive neuroscience.⁴⁷

As military theorists discuss the importance intelligent warfare [智能化战争], the PLA is expanding the Triad reform to incorporate emerging technologies and their potential impact on future warfare. Military educational institutions propose an intelligent military talent training system of systems [智能化军事人才培养体系] to develop a plan to train intelligent talent in the PLA to strengthen the ability of people to control intelligent systems, explore human-machine coordination, and brain-computer integration. Military education requires a curriculum system and knowledge base supporting intelligent operations disciplines. Simulations, virtual reality, and intelligent battle laboratories [智能化作战实验室] can support the establishment of a training environment to cultivate intelligent talent,

innovative operational concepts, and use of weapons and equipment in future wars.⁴⁸

A key to improving military academic education is connecting the classroom to the battlefield. The National University of Defense Technology reported in November 2021 its effort to promote actual combat teaching practice connected to the future battlefield. The university reportedly is deepening academic reforms and building a combat requirement driven curriculum by developing simulation systems and building a multi-level practical teaching platform. The faculty maintains contact with combat units and regularly organizes students to participate in exercises to provide battlefield experience.⁴⁹

Construction of a Quality Military Faculty

President Xi has identified the problem of military faculty lacking knowledge of joint operations and other advanced skills to meet the needs of cultivating joint talents for future warfare. While the PLA believes that the military faculty has shown improvements, outstanding problems remain.⁵⁰ Developing a skilled and innovative faculty, relevant joint courses and teaching materials at military educational institutions is a fundamental requirement in the PLA's quest to build a group of joint commanders and staff. The PLA believes that a quality military faculty are critical not only for imparting knowledge and mentoring, but also to fully mobilize the enthusiasm, initiative, and creativity of students. An important mission of military teaching staff is also to conduct research in military science, as well as being innovators in the development of military theory, technology, and teaching methods.⁵¹

There are proposals to improve military faculty, but the implementation and success is not known. General proposals include strengthening teacher's

dedication, virtue, sense of responsibility, and understanding of new educational theories through improved courses and independent learning for instructors. One proposal is to increase the opportunity for instructors to study abroad, particularly in foreign military academies. The PLA also recognizes the need to adjust the faculty structure with a more even distribution of young, middle, and older age teachers to create a stable faculty system. In addition, the Triad reform plans to add teachers with both military experience and advanced academic credentials. However, PLA press reporting indicates a great emphasis on political education and reliability that could hinder establishing a quality faculty with an operational focus.⁵²

Ultimately, one of the proposals that might achieve the greatest success is the implementation of a strong reward and punishment mechanism based on an accurate evaluation system. The PLA contends this would create a survival of the fittest system. A punishment system would provide a tool to cull inferior teachers, which apparently is not the case now. A strong reward system would not only recognize gifted teachers, but also instill greater enthusiasm and provide incentives to excel and innovate. However, a reward and punishment system would have to remain devoid of corruption.⁵³

PLA press reports from 2020-2021 provide evidence of attempts to improve military faculties. The Air Force Early Warning College reported that it was evaluating instructors and courses each year with outstanding teachers selected for distinction and upgraded salaries. The evaluations are based on innovation and connecting classrooms to the battlefield. The college's teaching standards are used for selecting new teachers and to eliminate personnel who are not performing. Key faculty

are sent to the field each year ostensibly to provide education to troops and gain a better understanding of operational requirements. The college invites outside experts to evaluate courses. PLA statistical data from the past few years indicate that the number of graduates from military educational institutions identified as key talent is increasing.⁵⁴ The National Defense University is conducting evaluations to accelerate and transform teaching and courses. The NDU also announced in May 2021 that it is selecting outstanding officers from the CMC, theaters, and services to serve as instructors. There had been indications that the program to bring officers from units to instruct at the military universities and colleges had experienced problems as officers returning to units were not receiving promotions, but this problem has apparently been addressed. Additionally, the NDU has organized a supervisory group to improve the quality of teaching.⁵⁵

Bringing in officers from the field to serve as instructors promotes the connection and cross fertilization between military educational institutions and units, as well as enhancing knowledge of unit actual combat training at the universities and colleges. These officers provide experience in battlefield reconnaissance, command and control, and offensive and defensive confrontation. Simulations and exercises are used to increase faculty knowledge of combat operations. As an example, the NDU brought a combined brigade deputy commander to its Joint Operations College. This officer spent at least two years at NDU teaching ten courses. The NDU has reportedly brought in some 236 outstanding officers to enrich the faculty.⁵⁶

Military universities and colleges apply the designation of “Famous Teacher [名师]” to instructors who understand and can teach military

art [strategy, operational art, and tactics]. The NDU is promoting this project to build a group of talented instructors knowledgeable about modern warfare. In September 2020, the NDU selected five professors as “Famous Teachers,” twenty teachers and researchers as outstanding young experts, and fifty teachers and researchers with potential as young talents. The NDU expects this cohort of talented teachers to develop joint talent that can fight and win wars.⁵⁷

Military faculty visit civilian universities to observe and learn, while military educational institutions invite civilian professors to enrich their faculties and introduce modern educational methods.⁵⁸ Other means of raising the quality of military faculty include recruiting young teaching and research talent from various resources including scientific research institutes, equipment manufacturers, military personnel, and civilians to inject new expertise into military faculties.⁵⁹

An innovative method to expand the military faculty is the employment of select students with unit or position experience to lecture. An example is the Army Service College where an instructor and two students developed a highly praised course. Military universities and colleges also invite personnel to lecture on their practical experience. An example of this is a military transportation professor inviting personnel from a transportation unit and dispatch centers to share their experience. According to PLA press reporting, the use innovative teaching methods helped revitalize the quality and effectiveness of teaching resources while providing a bridge between the classroom and the training ground.⁶⁰

Teaching evaluation in military universities and colleges is viewed as a continuing process to refine the method and is considered a key

component of improving military faculties. Political, battlefield expertise, innovative research, and technological developments are crucial factors in faculty evaluations. Military universities and colleges view an ability to stimulate and motivate students to seek knowledge as important faculty qualifications. Unit personnel also provide input into faculty evaluation criteria, further integrating the classroom and battlefield.⁶¹

Military Educational Institution Evaluation

The CMC TAD provides top-level design [顶层设计] to plan and implement the Triad strategic plan for standardization of joint education and training, acceleration of joint talent development. The CMC and the service headquarters provide a two-level management system for the military academic institutions. This high-level direction includes establishing norms for military university and college education syllabus and courses. Each syllabus contains training objectives and requirements, main course subjects and content, and assessment criteria. The current focus is accelerating the construction of teaching for joint operations and deepening comprehensive training reform.⁶²

Joint Military Talent Requirements and Evaluation

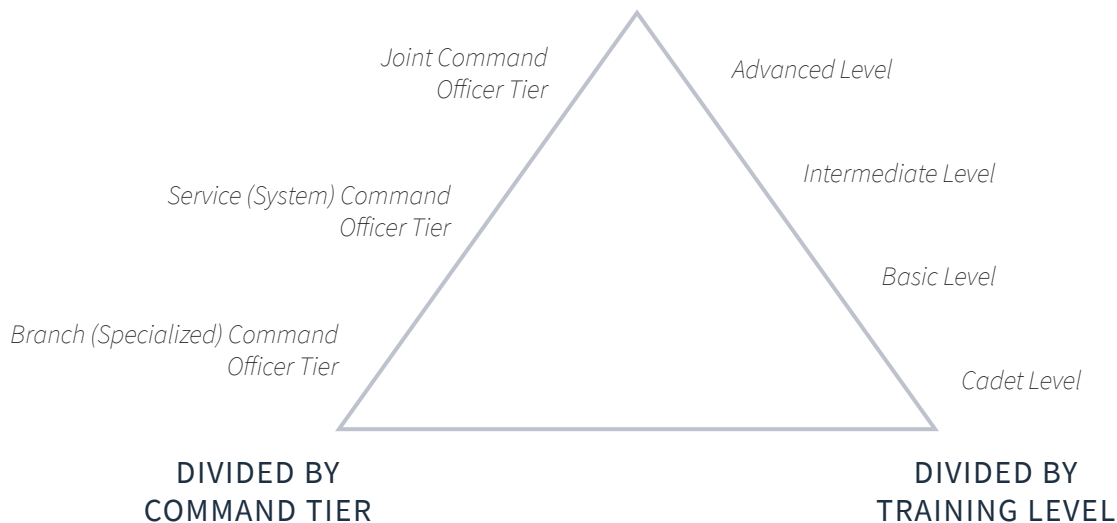
The PLA stresses high quality joint operations skills for joint officers. The PLA also emphasizes strong political reliability, courage, physical and mental qualities to meet the dynamic, highly destructive, and psychologically stressful modern battlefield. Modern warfare requires joint commanders to make operational decisions affecting the course of an operation and survival of units while under conditions of great stress.⁶³

In April 2008 the CMC issued the “Outline for People’s Liberation Army Command Officer

Assessment and Evaluation” [中国人民解放军指挥军官考核评价纲要] and the former General Political Department issued the “People’s Liberation Army Implementation Measures for Command Officer Assessment and Evaluation” [中国人民解放军指挥军官考核评价实施办法], and the “People’s Liberation Army Command Officer Assessment and Evaluation Standards [Trial]” [中国人民解放军指挥军官考核评价标准[试行]] providing an initial basis for a standardized command officer evaluation system based on the requirements of scientific development to strengthen the command officer corps. The evaluation system includes assessment results feedback, appeal, and validation. The evaluation criteria form a basic scale for measuring command officers’ quality and performance with position responsibilities and training within the Triad reform.⁶⁴

The PLA is developing standards to ensure quality control in joint command education including the “three-tier four-level” structure for command officer cultivation. The transformation process for joint command officers progresses from theory to practice, from basic knowledge to specialized knowledge, and from branch/arms to the joint command and operations. The establishment of joint command quality standards not only affects the quality of joint officers and staff, but also the quality of military university and college course content. The PLA has developed the new generation of revolutionary soldiers “four haves” [四有] for officers to possess: have spirit [有灵魂], have capability [有本事], have courage [有血性], and have integrity [有品德]. Further, joint command officers are required to be absolutely loyal [绝对忠诚], absolutely pure [绝对纯洁], and absolutely trustworthy [绝对可靠]. These new standards require joint officers to

Figure 2: "Three-tier, Four-level" Structure for Command Officer Cultivation

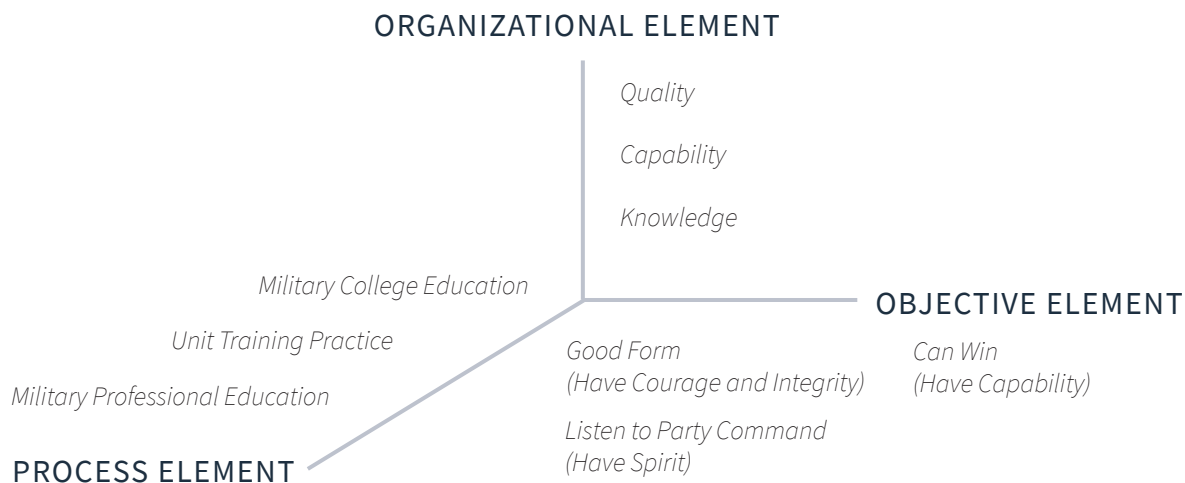


embody high reliability and personal qualities in addition to possessing capabilities to win battles and accomplish the tasks of future joint warfare. The reform seeks to replace the traditional concept of quality and capability evaluation standards by qualities highlighting informationized warfare system integration, information fusion, and mastery of modern combat theory and operational methods.⁶⁵

Evaluations of command officers must consider various content and elements. Evaluation criteria are divided into *general standards* and *duty post standards*. There are five general standards of performance with 14 evaluation elements. The general standards include the following: *morality* covers primarily political performance; *capability* for decision planning, education management, unity and cooperation, organizational command, and innovation; *diligence* concerning work style and mental state; *performance* covering completion of tasks; and *form* covering mental and

physical qualities. In addition to general standards, there is also duty post standards that reflect special requirements of command officer duties and responsibilities. There are three proposed [as of 2017] elements of personnel training standards: *knowledge*, *capability*, and *quality*. Knowledge contains 18 elements, capabilities 30 elements, and quality 25 elements. Additional skills and capabilities requirements were added in 2014 including use of the comprehensive battlefield situation map, capability to operate the integrated command platform, use of operational data links, capability to use networks and communications equipment, and use of the combat database.⁶⁶ It is likely that the theater training leading to qualification certificates are based on these standards.

Figure 3: Command Officer Joint Education Quality Standard Element Model



The PLA announced in January 2021 that the CMC had issued “Interim Provisions on the Assessment of Officers in Active Service [现役军官考核暂行规定]” to provide a basic guideline for officer assessment in the new era. The intent is to enhance management of officer career development and their capability to train and prepare for war. A combination of quantitative and qualitative criteria includes political quality, professional ability, responsibility and spirit, work performance, and integrity and self-discipline. Different standards are applied to command and management officers compared to professional technical officers. The regulation is to promote both political reliability and operational capabilities. Officer assessments are linked to their education and training and include rewards and punishments.⁶⁷

Military Education Management

The TAD’s Professional Education Bureau is responsible for centralized management and supervision of the Triad system military professional education program. It also supervises joint professional development in the theaters

and services.⁶⁸ Centralized management and support for the Triad reform is provided by the following documents: the “Outline for College Education Teaching” provides an overall plan and requirements for military education; “Outline for Unit Training Practice” provides integrated requirements and evaluation for military unit training; and “Outline for Military Professional Study” provides planning and requirements for professional education programs.⁶⁹

Unit Training Practice

“Unit training practice⁷⁰ [部队训练实践]” is intended to improve joint talent and training. This includes military theory education, teaching of operational skills, and military drills to train troops. Unit training practice is critical for enhancing the capability to fight and win wars, as well as an important basic program to develop command officers. Comprehensive exercises integrate personnel and equipment, transform theory into practice, and place the classroom in the battlefield. The PLA believes that in order to improve joint education, military education needs to move closer to unit training, focus on actual combat

training, and form a seamless linkage between military educational institutions and units.⁷¹

Joint Teaching and Training

Joint teaching and training leverage the military education institutions and provides joint coordination between military academic institutions and units. Teaching institutions and training bases are jointly organizing teaching and training activities by utilizing information, multimedia, and network technology to expand education and provide distance teaching and training to improve the efficiency of training and education. Joint coordinated education [联合协同教育] is based on joint teaching and training. Joint teaching and training use military educational institutes teaching and research to support unit training. Military academic institutions intended to increase coordination and cooperation working together in supporting unit training. The effort builds on cooperation centers created in 1980 including military educational and research institutes and units. These centers shared resources to improve the quality of education and training. While locally based, the centers also conducted cross-region cooperation. Cooperation centers were established in Beijing, Shijiazhuang, Changchun, Changsha, Xi'an, Nanjing, Wuhan, Qingdao, Chongqing, and Zhengzhou.⁷²

Joint teaching focuses on the joint development talent program and joint training focuses on actual combat training of troops. The PLA intends to emphasize standardization of joint teaching and training including participation of military academic institutions and units in joint exercises. An example is a college or university deploying instructors and students to conduct on-site teaching and participation in the military training. At the same time, troops go to the military

academic institutions for leaning and participation in seminars. The PLA believes this system will better utilize military resources and provide cooperation between military education and training to improve unit actual combat training and enable students to absorb the latest military training methods.⁷³

Joint teaching and training provide a unified plan to improve the interaction between military academic institutions, and military units. Military colleges and units develop plans at the beginning of each year. Academic instructors provide education on unit construction, weapons and equipment, and the battlefield environment during visits to units, as well as observing major exercises. Personnel from units visit military colleges to teach students about unit equipment, training facilities, and observe military college exercises. Military universities and colleges jointly conduct online joint exercises between themselves and with units, while colleges and units participate in joint exercises. College personnel participate in the command organization or provide guidance during field training. Military colleges and units form joint research groups to develop innovative operational methods, study the laws of warfare, and research military modernization.⁷⁴

The “Joint Teaching-2012 Queshan” [“联教-2012 确山”] exercise is a well-documented early example combining military educational institutions and field training. The former General Staff Department directed, and the Shijiazhuang Army Command College lead an exercise at the Queshan Combined Arms Tactical Training Base. The exercise provided a show case for military school and unit integration in education and training. The training included employment of a joint tactical formation and participation of nineteen military educational institutions.

This training featured joint planning, joint firepower strikes, joint maneuver and offense, and employment of the command information system. The PLA considered this the first multi-dimensional joint teaching and training exercise with the military academic institutions, and the services and forces.⁷⁵

The Air Force Engineering University provides a recent example of the combining of military universities and colleges with unit training. This university's Equipment Management and UAV Engineering College is integrating student education and field training. The college formed a joint education and training mechanism with brigades to send students to the training ground to participate in combat training. An evaluation system assesses the progress of students and identify shortcomings requiring adjustments to the program. The college believes that this program provides students with valuable field experience prior to graduation.⁷⁶

Military education institutions continue to collaborate with units transferring research results and battlefield experience enriching both the military universities and colleges, and units. Military universities and colleges support the construction of combat effectiveness, while the field experience promotes bringing actual combat experience and a better understanding of tactics and unit requirements to the classroom. The PLA believes this program will improve the effectiveness and innovation in teaching and research in military educational institutions. Units will also send personnel to the classroom to impart their experience in exercises and training on various subjects.⁷⁷

Military Professional Education

“Military professional education [军事职业

教育]” offers online courses throughout the military to promote professional, specialized, and innovative qualities. This element of the Triad reform offers open and life-long learning activities to expand and supplement military education and training through online courses. The TAD's Professional Education Bureau provides top-level design for military professional education. In August 2017, the CMC issued the “Military Professional Education Reform Implementation Plan” launching the reform of this component of the Triad system. The plan includes the “network + education” program for sharing of resources and provision of online learning. A pilot project within the military was implemented within 24 units to be completed by the end of 2018.⁷⁸

In November 2017, a military professional education internet service platform began tests, which includes a mobile app, web version and WeChat service number. The overall program includes leveraging civilian educational resources to improve the program. Tsinghua University, Peking University and other civilian education resources are supporting the effort. A key aspect is continuing assessment and revision of the program as needed.⁷⁹

In May 2018, the TAD issued 826 military professional education key curriculum construction tasks. The TAD directed the NDU, NUDT, other colleges and units to meet the diverse and individual education needs of military personnel to undertake curriculum construction tasks meeting mission requirements. This includes courses to advance strategic, joint, and technological literacy.⁸⁰

The Air Force initially took the lead in developing military professional education for its officers and men. The Air Force developed a pilot military professional education program for the service in 2017. Online courses, instructional videos and digital resources including special databases and textbooks are available. The internet platform links national and local resources for education. The pilot project received feedback to further refine and improve the online learning system. The other services including the Rocket Force, Strategic Support Force and People's Armed Police have initiated projects to serve their specialized needs.⁸¹

“Regulations on Military Professional Education of the Military [for Trial Implementation] [军队军事职业教育条例[试行]” were issued by the CMC in January 2021. The trial regulation is intended to strengthen the Triad reform, build first-class talent, focus on requirements for war, promote the teaching of new theories, technologies, equipment, tactics, and training methods through the military professional educational platform. The regulation clarifies the roles in promoting the educational reforms at each echelon from the CMC to units including the People's Armed Police, military universities and colleges, scientific research institutes, and training institutions. The regulation also integrates military professional education into the military personnel assessment system as an important criterion for evaluation for performance and certification⁸².

The PLA believes military professional education boosts military talent, improving performance and professionalism. Individual learning activities and quality network education resources relying on technological innovation can reshape military professional education to better support joint education as the age of intelligent technologies

impacts military affairs. The aim is to create a joint command college without walls.⁸³

Ubiquitous Learning: Online, Open, and Continuing Military Education

Previously, most PLA military education was limited primarily to the military classroom. Courses were criticized as not being innovative or directly relevant, and military personnel as having passive learning habits. The PLA intends to apply innovative models and means to improve military education, including methods derived from civilian education. The PLA is addressing the issues of innovation, interactive and continuing education with open online courses. The online platforms support sharing of resources and expertise between the military academic institutions. The continuing military education is to adapt to and support a military career development ladder.⁸⁴

In addition to the NDU joint learning programs, military academic institutions have embarked on ubiquitous learning. Ubiquitous learning is an outgrowth of ubiquitous computing and enabled by the advent of digital media. Ubiquitous learning provides a constant, anywhere, anytime, lifelong learning experience using media sharing and communication including through mobile devices and wireless networks. The PLA considers this development as particularly important in supporting military professional education. The PLA is developing standards for online and self-study courses.⁸⁵

As part of ubiquitous learning, the PLA has established a massive open online course [MOOC] program. MOOC is a popular large-scale online course program that originated in the US in 2012 with top universities such as Harvard, Yale and Columbia Universities launching their MOOC programs. NUDT launched a MOOC platform in

2013. The “Dream Course Learning Platform” [梦课学习平台] is a large-scale open online course platform open to all officers and men in the PLA. In March 2016 there were 16 universities, colleges and other educational institutions joining the military to launch 130 courses. Courses include those for joint operations command and support personnel for continuing and lifelong learning. The platform supports academic education courses, military professional education, and unit training practice courses of the Triad reform.⁸⁶

The PLA continues advance military professional education with online learning pushing courses to institutions and units for the benefit of officers and troops. The PLA is standardizing this education method through laws and regulations for its implementation. The regulations appear in part to place requirements on personnel. The military professional education system is tied to performance characteristics and professional development requirements, provides scientifically developed personal plans and on-the-job independent learning to enhance job performance and career development.⁸⁷

Current PLA Assessment of Triad Reforms

A PLA Daily article from January 2021 stressed the importance of the Triad reforms for building a new-type high-quality professional talent phalanx combining military capabilities and political integrity. The article noted while the reform effort has laid a foundation, there remains a need to accelerate the reforms as shortcomings remain. The development of quality military personnel is critical in advancing national defense modernization, gaining initiative on the battlefield, and preparing for future warfare. The three pillars of the Triad reform—military academy education, unit training practice, and military

professional education—have different functions and focus but are complementary, interactive, and indispensable. Military academy education is the foundation for personnel training. Problems still exist in bringing the battlefield into the classroom and preparing for future combat requirements. Unit training practice presents a large platform for personnel training and transformation of the force. Military professional education creates an expansive classroom to reach out and improve personnel training through online courses. However, current online courses are insufficient, with a lack of incentives to promote lifelong learning. A traditional mindset remains hindering the execution of the military education and training reforms.⁸⁸

The CMC held a conference from 26-28 November 2021 on the need to strengthen the cultivation of military talent. This conference appears to be recognition that military education reforms are not achieving their goals, requiring acceleration and renewed efforts by the leadership. The conference declared that developing military talent is necessary to advance the goal of advancing the high-quality development of the PLA. While the conference noted that achievements related to military talent cultivation have occurred since 2012, President Xi called for greater efforts to improve the scientific and technological literacy of military personnel to improve their ability to win modern wars, as well as the accelerated establishment of first-class military schools. President Xi stated that the cultivation of military talent is required for joint operations command, leading new-type operational forces, scientific and technological innovation, and high-quality strategic management. The PLA recognizes the importance of developing military talent for the PLA’s transformation efforts but continued calls

to accelerate and improve the reforms appear to be an admission that these reforms are not achieving the required goals.⁸⁹

JOINT TRAINING REFORM

The PLA is implementing joint training reforms to build towards an integrated joint operations capability. The reform of military education connects with joint training enhancements as the PLA attempts to build a synergy between military education and training. Integrated joint operations are conducted at the strategic, campaign and tactical levels. There is a focus on improving joint tactical training as the PLA intends to push joint actions down to the tactical level employing joint tactical formations [a modular joint task force at the tactical level]. Improved and accurate training evaluations are intended to enhance the quality of joint operations capabilities through training that approaches the actual combat conditions. Importantly, the PLA believes that improved and realistic joint training can support modifications and perfection of operational plans as training is based on wartime missions in each theater.⁹⁰

The primary purpose joint campaign training is to develop commander and staff knowledge of military theory, organization, and command capabilities. The significance of the joint training with a focus on commanders and staff abilities is reinforced by the military educational reforms to develop joint command talent. The PLA believes that command and organization of joint forces represents the greatest training difficulty. Strategic training is focused on high level mastery of warfare principles and methods for strategic commanders and staff, and national security related institutions. Exercises, seminars, and lectures focus on strategic planning, national

security policy, and military strategic decision-making to improve joint staffs. Specialized joint training emphasizes basic capabilities including operational elements [warfighting capabilities] such as reconnaissance and intelligence, and command and control, as well information coordination and confrontation. In addition, joint training includes non-war joint operations, the testing of new weapons and equipment, and experimental exercises testing new operational concepts.⁹¹

Background

PLA joint training is divided into the following areas: basic, tactical, campaign, strategic, and specialized. Unit training focuses on specific joint operations and support tasks, as well as the formation of task organized force groupings. Complex and varied joint operations requirements affecting joint training include command and coordination, employment of communications and information systems, operations in a dispersed and multidimensional battlespace, non-linear operations, non-contact operations, joint firepower strikes, rapid transitions between offense and defense, information attack and defense, comprehensive and integrated support, the role of special operations, as well as non-war operations. The PLA also participates in multinational joint training primarily focused on problem areas of joint command structure, coordination and organizing coalition forces.⁹²

Joint basic training includes the following subjects:⁹³

- Military thought and strategy
- Informationized warfare theory
- Joint operations and training theory
- Joint military operations other than war theory

- Joint operations command, coordination, and various support theories
 - » Joint operations logistics support theory
 - » Joint operations equipment support theory
 - » Joint operations political work theory
- Military information technology and information systems knowledge
- Joint operations service and branch knowledge
- Joint operations and training case studies
- Joint operations battlefield environment
- Joint operations and training regulations
- International law and laws of war, ethnic and religious laws knowledge

Joint specialized training includes the following subjects:⁹⁴

- Reconnaissance and intelligence
- Communication network training
- Command and control
- Multidimensional maneuver
- Firepower coordination
- Comprehensive support
- Target support
- Service and branch interoperability and confrontation joint training
- Information coordination and confrontation
- Joint obstacle breaching and set up.
- Joint search and rescue
- Joint force protection

Joint training is also divided into capability and task-based training. Capability training is based on basic joint operations elements such as reconnaissance and joint strike. This type of

training usually takes a building block approach moving from simple to complex and finally developing a specific joint capability to support task-based exercises. Joint task training is focused on the practical application and integration of basic warfighting capabilities during a specific scenario, typically based on an operational plan.⁹⁵

Joint training is also focused on joint campaign and tactical formations' command, coordination, composition, and restructuring during operations. The employment of a modular approach to forming campaign and tactical operational system of systems [an integrated task force capable of relatively independent operations] should be a vital component of joint training.

High Level Training Management

High level organizations are beginning to provide unified leadership and management over joint training. The TAD establishes requirements for actual combat [实战化] training. Actual combat is warfighting-oriented training that approaches the environment and conditions of real combat to overcome the PLA's lack of combat experience and peacetime mentality. Reform plans include accelerating the construction of simulation training centers, specialized laboratories for research, upgrade training bases, and conducting research on new methods of joint training and exercise design. The TAD provides guidance to the theaters on planning joint exercises to ensure standardization. The theaters plan joint training based on each theater's wartime missions. The PLA intends the regularization of joint training to extend more effective and sophisticated training methods throughout the entire force. Simulation centers and Battle Labs provide significant support to joint training of commanders and staff.⁹⁶

The TAD established a “nerve center” [神经中枢] coordinating group to provide unified leadership and planning of the entire Triad reform plan to avoid the problems of multiple departmental responsibilities. The Training Supervision Bureau subordinate to the TAD began monitoring military training beginning in the first half of 2016 to provide high level management. The bureau monitors important service exercises, theater joint exercises and military university and college training and education. The Training Supervision Bureau established a military training inspector team [军事训练监察员队伍] in 2017 to support supervision and monitoring of major exercises.⁹⁷

In April 2018, the TAD held a special meeting of the theaters, services and branches, People’s Armed Police, and CMC organizations to examine military training in the previous two years and adherence to the 2016 “Interim Regulations for Strengthening Actual Combat Training” intended to rectify problems. The leadership of the Training and Supervision Bureau discussed accountability, as well as linking evaluation and punishment of units to promote realistic training. The TAD previously identified more than 630 problems with 90% of the issues rectified. The relevant departments of the CMC plan to create a special network for supervision of military training with reporting to the CMC’s Discipline Inspection Commission to reign in corruption in training evaluations. The meeting also explored the establishment of a “Double Accountability” mechanism focused on eliminating the peacetime mentality and requiring responsibility and rule of law for training.⁹⁸

Joint Training Guidance

The PLA believes the development of regulations on joint operations, joint command and coordination

and joint training is of immense importance. The PLA notes that the US military has issued more than 110 joint publications. In 2013, the PLA was in the process of updating joint operations basic guidance, to include a new “Joint Campaign Outline” [联合战役纲要], “Joint Operations Command Outline” [联合作战指挥纲要] and “Joint Campaign Coordination Outline” [联合战役协同纲要]. This guidance will provide the conceptual foundation needed to reform the joint training program structure. This includes a “Strategic Training Program” [战略训练纲目], “Joint Campaign Training Program” [联合战役训练纲目], “Unit Joint Training and Evaluation Outline” [部队联合训练与考核大纲] as well as specialized training documents for various operational elements such as reconnaissance and intelligence, command and control, joint firepower strikes, and logistics.⁹⁹ However, a NDU book on theater joint command from 2016 stated that regulations on command relationships remained vague and lacking in detail, and did not support organized and purposeful command.¹⁰⁰

Joint training missions have also transitioned to those the PLA views as most likely. In the mid-1990s the focus was on urban warfare, amphibious landing operations, mountain warfare and airborne landings focused on a Taiwan invasion. The current focus of joint training, and therefore operational plans, is primarily on joint firepower strikes, regional blockade operations, island offensive operations, air defense operations, border counterattack, anti-terror and maintaining stability operations, and others. While an operation against Taiwan is still a primary focus, border conflicts and internal unrest are also a concern.¹⁰¹

In February 2019, the TAD announced a regulation on military training supervision, described as the first of its kind. The new training regulation

is intended to improve combat readiness, rectify corruption related to military training, and eliminate problems hindering actual combat training. The regulation prioritizes supervision of military training, standardizes methods for organizing training, and refines criteria for determining training violations.¹⁰²

In the past several years the CMC has convened two conferences on the need to improve joint training. In November 2018 the CMC issued a document to improve joint operations capabilities and held a training conference. The outline to improve joint combat capabilities established basic concepts and rules, clarified responsibilities, and addressed fundamental questions on fighting future wars and strengthening war preparedness.¹⁰³ Reinforcing the need to improve joint training, the CMC held a Military Training Conference on November 25, 2020. This conference focused on training reforms was likely an admission that previous reform efforts had not achieved their goals. The conference focused on developing a new training system based on fundamental training goals to prepare for winning wars and improve actual combat and joint training by leveraging science and technology, encouraging training innovation, and establishing a new military training system. As an example of renewed focus on improved training, units from a Northern Theater Command Air Force base in 21021 began adding more complex and integrated training by organizing confrontation training once a week, combined tactical exercises once a month, and a full-element system of systems confrontation exercise every quarter based on the new training system guidance.¹⁰⁴

Training Evaluation

As with military academic education, improved

and accurate training assessment and evaluation systems are important to develop joint capabilities. The PLA intends to continue improving training assessments and eliminate corruption in these evaluations. The PLA assesses the quality of training based on various indicators. These include the overall amount of training time for units, confrontation, and simulation training, as well as training content. Live fire, confrontation, and simulation training quality are given more weight in evaluations.¹⁰⁵

In 2014 the former GSD's Military Training Department revised unit training evaluations. Changes were made to evaluate unit training throughout the year replacing end of year evaluations. Another change was to emphasize assessment of command organizations and unit capabilities. Areas of evaluation included command organization planning of reconnaissance, electronic warfare, firepower strikes, comprehensive protection, employment of the command information system, offensive and defensive actions, deployment and maneuver, support, capability to conduct continuous combat, and non-war actions. Furthermore, assessments are to be fair, accurate, and expose problems for corrective action.¹⁰⁶

The Training Supervision Bureau began monitoring military training beginning in the first half of 2016 to provide high level management. The bureau monitors important service exercises, theater joint exercises as well as military educational institutions.¹⁰⁷

An assessment group will evaluate a unit during training. Units can question an evaluation and the assessment group can alter their final determination. There is flexibility in the assessment group's appraisal. There are reports of units attempting to game the system by finding out the

members of the assessment group and evaluation criteria in advance. However, the composition of assessment groups and evaluation criteria are not fixed and can change at the last minute defeating a unit's attempt to cheat. The unit leadership and assessment group hold review meetings after the training to discuss the evaluation for lessons learned.¹⁰⁸

Collection and analysis of training data is important for unit evaluations, as well as providing valuable data for research to support future training and doctrinal development. The PLA considers conducting exercises approximating actual combat conditions as vital for supporting research to improve future training and operational methods, as well as a means to overcome lack of combat experience and peacetime mentality. Data is collected on the following joint campaign and tactical training subjects: unit mobility and maneuver efficiency; coordination between units; joint firepower strike coordination including detection and destruction effectiveness; joint operations assault coordination and effectiveness; information attack efficiency; electromagnetic spectrum management; and force protection effectiveness.¹⁰⁹

Unit evaluations are improved with assessments made on commanders and staff organization for reconnaissance and intelligence, electronic warfare, firepower strike, comprehensive protection, command information system capabilities, force maneuver, offensive and defensive operations, support, and sustained combat capabilities. Joint testing includes joint basic training, joint special training, joint command training, and joint exercises including various strategic directions joint campaign and tactical exercises as well as joint non-war exercises. Inspections are conducted to ensure the evaluations are fair, accurate and

credible.¹¹⁰

A survey of training evaluation and assessment articles from 2020-2021 indicate training evaluations are made both for individuals and units. Evaluation methods do not appear uniform and PLA press reports on units developing their own evaluation methods. Non-uniformity of evaluation methods would seem to cause problems when comparing training evaluations. A PLA Daily article from March 2021 discusses the need for training standards, indicating they still do not exist. The author argues uniform standards are required that reflect the needs of future combat to improve combat capabilities. Personnel conducting unit evaluations can inject changes into the exercise to assess how the unit adapts to unforeseen events. For example, in one exercise the assessor withdrew several personnel from an artillery unit. The sudden change caused the unit to become passive resulting in an unsatisfactory unit evaluation. On the other hand, there is the example of an officer who studied military publications on warfare to inject tactical innovation into his unit's field training. The assessment team ended the exercise because he was not conforming to the intended training process. This sort of fixed process can stifle tactical innovation, while those who understand and conform to the assessment process will receive high scores. At least some within the PLA understand that a rigid assessment process will not lead to victory in combat or eliminate the "peace disease" found in the PLA. Only time will tell if this sort of adherence to formalism is eliminated from training.¹¹¹

The PLA's reorganization and ongoing modernization has created problems affecting training. Units are reporting that training is uneven leading to lower combat readiness levels. Units also report on training issues with integration of

new equipment. There are also reports that units are not seriously training under realistic combat conditions or attempting to falsify evaluation results. The PLA is attempting to promote realistic training assessments to improve combat readiness throughout the force, and to train towards actual combat requirements. There are PLA press reports of evaluations that stress units and individuals with complex battlefield environments with no training scripts. However, reports of problems persist including a lack of uniform evaluations standards and a continuing peacetime mentality amongst some in the PLA.¹¹²

Joint Training Areas and Bases

The PLA continues to rely on and upgrade military training cooperation zones and large training bases. Military training cooperation zones [军事训练协作区- MTCZ] have been important joint training locations for several decades, with at least one of these large joint training areas in each theater.¹¹³ The former Jinan MR's Weifang MTCZ [now located in the Northern Theater Command] is the most documented MTCZ and the location for a series of joint training experiments under the Lianhe exercise series during the first decade of this century.¹¹⁴

Combined arms tactical training bases [合同战术训练基地 - CATTB] are in each theater. Originally established primarily for ground force combined arms training, these training bases have evolved into sophisticated exercise venues featuring facilities to integrate wargaming and simulation training, exercise monitoring equipment to support unit evaluations, umpires, and multiple integrated laser engagement systems [MILES] to provide greater realism, specialized training facilities, and increasingly support joint training between the Army and the Air Force. The Zhurihe

CATTB in the Northern Theater Command is one of the most publicized and sophisticated of these training bases and is increasingly becoming a “national” training center frequently hosting training of units from other theaters.¹¹⁵

Simulation Centers and Battle Labs

The PLA describes “warfighting experimentation [作战实验]” using combat simulations to study operational problems in a controllable, measurable, and near-realistic simulated confrontation environment. The simulations provide analysis and evaluation of combat experiments. Joint simulation training can validate joint operational methods, provide confrontation training, and conduct research on employment of new or future weapons and equipment. Joint simulation exercises train joint commanders and staffs, as well as link dispersed field training together in a joint exercise scenario. The dispersed training supports long-range synchronization of operations by the dispersed staffs and units, which approximate the PLA’s vision of the future battlefield. Simulation and wargaming provide an efficient and cost-effective means for experimentation and testing of new operational concepts.¹¹⁶ Simulations and dispersed joint training also conceals the exercise scenario and full scope of the training, creating difficulties in assessing joint training quality and new operational developments.

The 2004 China defense white paper reviewed the use of simulation and network training to improve joint capabilities. Progress had already occurred at that time to improve simulation and network training, with all services and branches having established tactical simulation training systems for command training. An “All Army Academy Operational [Joint] Laboratory Training Simulation System” [全军院校作战]

联合]实验室训练模拟系统] supports integrated training between military command educational institutions, services, and branches.¹¹⁷ The Academy of Military Science contains a Joint Operations Experiment Center under its War Research Institute. The center researches joint campaign confrontation experimentation and innovation.¹¹⁸

The PLA press reports that at least some tactical units have simulation training rooms to strengthen combat capabilities. An exercise director department—a temporary institution for planning and organizing the exercise—supervises and referees the training. Training data is recorded and analyzed. Academic experts improve the simulations with technology such as artificial intelligence technology. Virtual reality training systems are increasingly used to provide immersive experiences in training, particularly for specialized troops such as special operations forces. Simulations and virtual reality training allow units to replay a scenario or alter the training task based on requirements. Simulations also allow units to train against an opposing force in realistic battlefield environments. The command confrontation simulations are important for training commanders and staff on combat missions and tasks, and to refine operational plans in response to the actions of the opposing force.¹¹⁹

The PLA defines Battle Labs [作战实验室] as specialized facilities for conducting combat experimentation and research. Battle Labs are an essential information age simulation means to evaluate new or future operational theories and verifying concepts before moving to expensive field testing. However, the PLA considers its Battle Lab system as incomplete. Some Battle Labs have been established, but it is unclear whether they are coordinating work with other

research laboratories. The former Shijiazhuang Army Command College established one of the first Battle Command Laboratories in the PLA. PLA press reporting indicates Battle Labs established in the Eastern Theater Command, Navy Command College, Rocket Force, Air Force and in unnamed military universities.¹²⁰ In 2010 the PLA called for strengthening the construction of Battle Labs at academic institutions with modern equipment including virtual reality and artificial intelligence, promoting sharing of resources, and linking with regional joint training bases.¹²¹

As part of the military education institutions emphasis on realistic training, and combining the classroom and the battlefield, wargaming and simulations are a means to train students. The Air Force Command College holds simulation confrontation exercises with the Combined Arms Tactics Department forming the opposing force. Air Force personnel from various bases also participate as the opposing force in these wargames. An assessment group evaluates the wargame, and a database of exercises is maintained for research. This is part of the reforms to provide realistic training for students and leveraging active-duty experts.¹²²

The PLA also conducts command post exercises (CPX). The Southern Theater Command held a large-scale CPX in August 2021 designed to improve joint operations command capabilities in the theater. The exercise employed new tactics and innovations. The CPX included a confrontation tabletop wargame conducted by the Southern Theater's Operational Research Office.¹²³

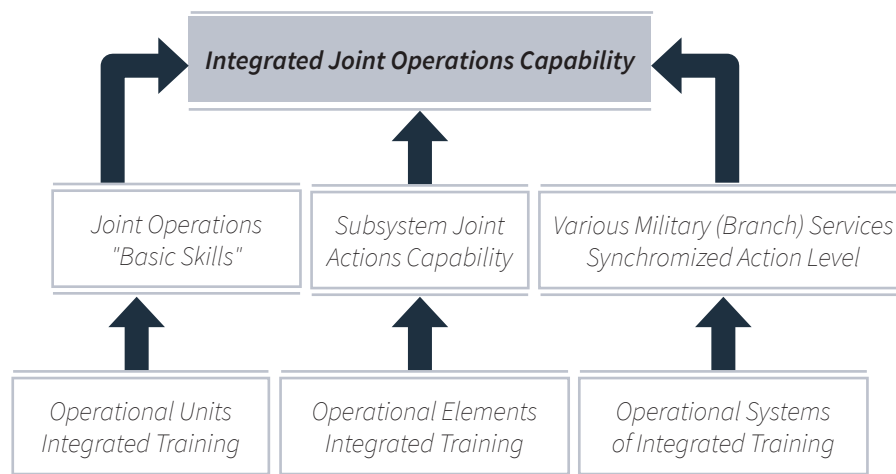
System of Systems and Integrated Joint Operations Training Plan

The PLA's training focuses on developing a system of systems and integrated joint operations capability. The complexities of integrated joint operations place greater requirements on commanders and staff. Systems of systems training integrates forces, systems, and weapons platforms from the tactical to strategic levels. This includes training of joint strategic groups, joint campaign formations, and joint tactical formations that conduct operations as operational system of systems. The PLA views operational system of systems as integrated modular task organized force groupings that can conduct relatively independent operations at the strategic, campaign or tactical levels. Campaign formations and tactical formations are operational system of systems employed on the battlefield. A high level of command and coordination skills is required to control dispersed forces across a broad, dynamic battlespace.¹²⁴

The PLA has proposed a series of training building blocks required to develop an integrated

joint operations capability. This includes unit integrated training leading to basic joint operations skills; operational element (basic warfighting capabilities such as command and control, reconnaissance, and firepower support) or specialized integrated training leading to subsystem joint action capabilities; and operational system of systems (integrated force grouping) training leading to joint forces synchronized actions. Within the context of these joint training building blocks, the PLA considers the following areas important in developing joint capabilities: integration of service weapons platforms and information networks, real-time coordination, the intelligence process, long-range digital communications, and complex combined arms training.¹²⁵ A requirement not mentioned is the capability to reorganize a modular joint task force as operational requirements change during the course of a joint campaign or action. It is unclear where the PLA has progressed in implementing this proposed training plan although the PLA has embarked on systems of systems-based training for the force.

Figure 4: Joint Training Building to an Integrated Joint Operations Capability



Joint Tactical Training

Joint tactical training has become increasingly important as the PLA intends to push joint operations down to the tactical level. This requires the education and training of joint commanders and staff at the tactical level to provide experience with joint combat principles and methods.¹²⁶ The former Jinan MR began conducting research field exercises on the organization of joint tactical formations in 2002, and joint training has continued to include these joint tactical modular task forces.¹²⁷

The PLA assesses that most units could not conduct tactical level joint operations due to technological, capabilities, and training limitations. Integrated joint communications and military education issues continue to hinder joint training efforts.¹²⁸ While these assessments are likely generally true for the PLA, there are units conducting advanced experimentation in tactical joint operations, for example the 82nd Group Army [former 38th Group Army] and a digitized division [recently reorganized as a heavy brigade] in the Central Theater Command.

In addition to communications and joint tactical literacy, the PLA has identified additional issues inhibiting joint tactical training. These include the partitions that have existed between the services leading to a lack of knowledge of other services' procedures, capabilities, and tactics; the required prominent level of specialized branch training within the services which limits the amount and quality of joint training; and coordination within and between services that has proved difficult for commanders and staffs at the tactical level.¹²⁹

GOAL FOR ACHIEVING TRIAD REFORMS

The PLA has established 2035 for achieving its current military reform strategic goals including military education and training. The PLA appears to believe that it is making progress in education and joint training with revisions made to adjust the reforms, although it admits much work remains. The goal of 2035 is reasonable for achieving reforms in joint education and training if key objectives are met and systemic barriers to the reforms are removed. These include controlling corruption adversely effecting military education and training, constructing a quality joint faculty and curriculum, improving pay, benefits, and rewards to attract and retain quality faculty, establishing effective evaluation methods for students, instructors, and joint training, and integrating the new military revolution based on intelligent technologies into military educational institutions' courses. However, the lack of progress of the military education reforms over the past twenty years leaves success in doubt. There appears to be an inability or institutional impediment derailing military educational reforms that the CMC needs to overcome. The modernization goals in the reform areas of joint education and training need to be clear, with implementation of a scientific systematic plan to improve the quality in these key areas guided by high level direction and management. Efforts by the CMC in 2020 to jump start training and education reforms seems to be an admission that past efforts are not achieving their goals, with adjustments and a renewed effort needed.¹³⁰

In early January President Xi issued a military training order for 2021 reinforced subjects addressed in the training conference. Military training objectives 2021 focused on actual combat training to raise combat readiness, joint command and joint specialized training, new equipment training to gain competency, and operational system of systems integration training. The PLA intends this year's training to support the transformation a new military training system discussed at the training conference.¹³¹ Only time will tell if this renewed effort to reform military training will achieve better results than past efforts to achieve realistic training and operationalize integrated joint operations.

SUMMARY

President Xi's current reform effort in part is focused on developing integrated joint and a system of systems operations capability to significantly boost the PLA's warfighting capability. Improvements in military education to develop joint talent, and joint training are critical elements for the successful implementation of these twin capabilities. Both joint and system of systems operations place complex requirements for joint commanders and staff, including command, coordination, information technology skills, innovation, and joint tactical combat. The military education and training reforms are addressing these requirements, although the extent and quality of implementation is unclear.

The PLA has identified problem areas related to joint talent development that could cripple President Xi's reform plans if not adequately resolved. These include corruption, lack of qualified joint personnel at all echelons, lack of innovation, outdated courses, poor instructors, insufficient

funds and resources, waste of resources, poor discipline and management, bureaucratic inertia, poor command capabilities, a peacetime mentality, lack of combat experience, and inadequate assessment and evaluation systems for individuals and units. *PLA Daily* articles still highlight many of these problems as continuing within the military.

The PLA's Triad system military education reform plan and improvements in joint training attempt to redress many of the issues. The Triad system reform plan modernizes and integrates three elements that have existed in the past: military academy education; unit training practice; and military professional education. Importantly, the PLA is integrating military academic institutions and unit training to enrich both areas with the exchange of knowledge and experience. Ubiquitous learning with online courses, teaching materials and resources is promoting continuing education throughout the force. Cross-training is a potentially effective means to provide joint experience and knowledge. The PLA intends to push joint learning not just to joint commanders and staff, but to the entire PLA. The National Defense University and National University of Defense Technology are playing important roles in developing joint talent and educational reform. Reform goals appear difficult for the PLA to attain as systemic problems continue in military education and training. In particular, the development of a quality joint faculty and courses appear to be the critical component to developing a cohort of joint commanders and staff. Readjusting the current mix and improving the quality of military faculties would appear to be a long-term project that the PLA has not adequately addressed so far.

The two-tier military and training management system consisting of the CMC and the service headquarters is intended to provide top-level

guidance and management of military education and training reforms. While high-level management is provided, lower echelons appear to have initiative in implementation. For example, the theaters are implementing a joint training and evaluation for commanders and staff leading to a qualification certificate, but each theater appears to be implementing programs independently. This appears to lack the standardization and uniformity expressed as a goal of top-level design and could well lead to varying levels of joint personnel quality and competence between the theaters.

Improvements in joint training include upgrades to joint training bases and zones, expansion of simulation centers and Battle Labs, and establishment of joint training evaluations over the course of the training year. The PLA is implementing a three-pronged building block training method to implement system of systems and integrated joint operations. The PLA is focusing on joint tactical training as it intends to push joint operations down to include joint tactical combat by joint tactical task forces. Actual combat training is intended to address the PLA's lack of combat experience and peacetime mentality. The PLA believes that enhanced joint training will lead to new operational methods, implementation of integrated joint operations, generation of greater warfighting capabilities, development of joint command and coordination procedures, and establishment of modular joint task-organized force groupings at the campaign and tactical levels.

President Xi's has repeatedly addressed the need to build a military educational system to cultivate joint talents to support military transformation. While noting that the military educational and training system has improved, he acknowledged that work remains. He recognizes that the overall training system does not match the

mission requirements of the new era or the new organizational form of the military. The traditional mindset remains, and military professional education is still in the initial exploratory stage.¹³² The PLA continues to identify problems and refine the reform plans, albeit slowly. The CMC's training conference in 2020 and conference on military-talent work in November 2021 are efforts to adjust and reinvigorate reforms.

The PLA reporting on the number of officers graduating from joint courses over the past five years is relatively small. The theaters are establishing joint training and certification of officers, but the quality of this program is unknown. Complex joint exercises provide training and experience for joint commanders and staff. However, the military educational reforms have continued for two decades or more, and the PLA continues to report problems while acknowledging some progress in reforms. While the current reorganization of military academies has met the 2020 reform goal, by the PLA's admission, the cultivation of joint talents will be a lengthy process. Bureaucratic inertia and resistance to change appears to continue to permeate the PLA and retard reform efforts in military education as well as training. The PLA could achieve significant reform goals by 2035, but the PLA needs to overcome impediments that have hindered past reform efforts, and meaningful change to both military education and joint training need to be achieved.

The ability of the PLA to conduct an advanced form of system of systems and integrated joint operations will take time and success remains to be seen, but this does not mean the PLA does not currently represent a lethal opponent. The PLA will need to rely on a hybrid form of joint coordinated operations during this transition period while it

incrementally adds integrated joint and system of systems operational capabilities to the force. The PLA should prove a dangerous opponent to enemy forces that are equal or inferior to its warfighting capabilities especially in limited conflicts of short duration. However, the PLA likely will face difficulties in lengthy conflicts against an advanced military capable of advanced joint operations, while still inflicting casualties.

IMPLICATIONS FOR PLA TRANSFORMATION

Successful implementation and continuing refinement of reform efforts is critical for the development of joint talents. Development of joint talents throughout the PLA at the strategic, campaign and tactical levels is a key requirement for the implementation of an integrated joint operations capability. The PLA appears to be attempting to address identified operational requirements and problems. However, by the PLA's own admission, serious problems remain including corruption, bureaucratic inertia, a peacetime mentality, and lack of combat experience. This inability to expediently implement required military educational and training reforms will extend the time required to achieve an advanced joint operations capability. The leadership eliminated bureaucratic obstacles delaying the creation of the joint theater commands; now the leadership needs to break the impediments to quality military educational and training reforms for PLA transformation to be successful.

A fully developed integrated joint operations capability would make the PLA a dangerous opponent in any regional conflict and globally as the PRC's interests extend further abroad. Even if the development period for a significant cohort of

joint commanders and staff is lengthy, incremental improvements in multiple areas including military education and training will gradually increase the PLA's combat effectiveness as it builds toward its goal of becoming an advanced armed force.

The PLA modernization effort is exceptionally complex simultaneously incorporating mechanized, informatized, and intelligent warfare into its capabilities as part of its transformation. The PLA is addressing the information revolution in its cultivation of joint talent, improvements in joint training, and modernization in general. The PLA's joint talent reforms are primarily focused on catching up and implementing the information technology revolution in military affairs and building an informationized warfare capability. Now PLA theorists are discussing the next revolution in military affairs based on "intelligent" [智能化] technologies which they believe can have a significant impact on all aspects of the military. These theorists believe that the intelligent technological revolution could provide an opportunity to leapfrog in front of the advanced militaries that have already incorporated information technologies.¹³³ While military educational institutions are beginning to incorporate intelligent technology issues into the classroom, the focus remains primarily on informationization. The PLA will need to rapidly catch up with the revolution in military affairs based on information technologies or risk falling behind in the new revolution based on intelligent technologies.¹³⁴

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