

Team Performance Taxonomy

Bloom's Taxonomy serves as the backbone of many teaching philosophies, in particular, those that lean more towards skills than content. This taxonomy is the basic tool for analyzing the training requirements within NATO's Global Programming. Although the taxonomy focusses on the individual, it also serves as the basis for assessing the collective site of the training spectrum and the consequent analysis. Is this the right approach?

Although named after Bloom, the publication of 'Taxonomy of Educational Objectives' followed a series of conferences from 1949 to 1953, which were designed to improve communication between educators on the design of curricula and examinations. Before the publication, educators viewed content as the vessel for teaching skills. The emphasis on higher-order thinking inherent in such an approach is based on the top levels of the taxonomy, including analysis, evaluation, synthesis and creation. Bloom's taxonomy can be used as a teaching tool to help balance assessment and evaluative questions in class, assignments, and tests to ensure all orders of thinking are exercised in learning.

Proficiency at the collective level requires forces, often joint, to engage quickly and to integrate their capabilities across domains, echelons, geographic boundaries, and other organizational affiliations. Since the individual's preparation is a prerequisite for collective effectiveness in the execution of tasks, individual and collective training must be viewed as a closely interconnected continuum.



Figure 1: Photographic Representation of the NATO Training Spectrum.

NATO’s Training Spectrum has two aspects (Figure 1 & Figure 2): Individual and Collective¹. It is then further described in four discreet areas, i.e. Education, Individual Training, Collective Training, and Exercises, which are defined as follows:

- Education – The systematic instruction of individuals that will enhance their knowledge and skills, and develop competencies. It is the developmental activity enabling individuals to make a reasonable response to an unpredictable situation (mind-set).
- Individual Training – The development of skills and knowledge necessary to perform specific duties and tasks. Individual Training is a learned response to a predictable situation (skills).
- Collective Training – Procedural drills and practical application of doctrine, plans, and procedures to acquire and maintain collective tactical, operational and strategic capabilities to predictable situations. It is focused on the collective performance of a Headquarters and/or a formation. The Commander has the possibility to stop the training event, correct the performance and repeat the execution.
- Exercises – Collective activities where Headquarters and/or formations are prepared to fulfil their missions, driven by external stimuli of a scenario and typically assessed on their readiness.

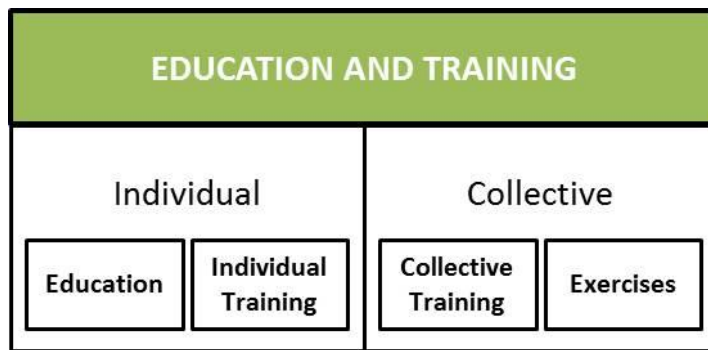


Figure 2 : The NATO Training Spectrum.

During the Training Requirements Analysis, a step within the Development Methodology, the tasks are examined in greater detail and further refined into Audience, Functional Area, Task Performance Statement, and Proficiency Level. The combinations of these 4 elements for

¹ Military Committee 0458/3 NATO Education, Training, Exercise and Evaluation (ETEE) Policy, dated 04 September 2014.

every task result in the individual and collective NATO E&T requirements². These requirements are eventually matched to existing E&T opportunities (potentially) open to NATO as solutions for satisfying the identified NATO E&T Requirements. The tool for matching requirements with solutions is a stratification scale of Job/Function Performance Level for requirements and solutions based on Bloom's Taxonomy.

A performant tool for the individual side of the spectrum, its use for the collective side neglects the difference in nature of both aspects. Using Bloom to stratify collective requirements and solutions assumes that, for reaching a certain team performance level, it is sufficient to bring the involved team members individually at that level. A collective level equals the sum of the individual levels. Collective training is reduced to a single training session done in group.

Although not explicitly recognized during the training analyses, the reports resulting from these sessions are limited on the collective side by stating the event(s) wherein the requirement is collectively trained or exercised. There is no way to assess the adequacy of the identified solution in satisfying the collective requirement as there is no collective element within this Bloom-based approach.

Collective training enhances team proficiency beyond simply putting the individuals together. Every effort to expand a Bloom-based Taxonomy towards the collective side will end in failure because the collective is more than just the sum of the individual capacities. Any proposal of a taxonomy for the collective side neglecting this observation has no value.

Studies

Collective training is certainly not a new thing. It has been done by professionals like the military, firefighters, emergency and disaster assistance teams. It is surprising that a search on the topic reveals few useful studies. The majority of the studies focus on the individual side; a limited number cover the collective side. These latter studies restrict themselves to small teams. Working in teams is a popular theme, but the studies or managerial books only cover

² It may be that the NATO E&T requirement can only be efficiently satisfied by a NATO E&T Solution combined with an 'On the Job Training' (OJT). This OJT is a responsibility of the organization the individual belongs to.

how to make a team out of a small group of people. The proposed methods do rarely include collective training of complete organizations.

In hindsight, this should not have come as a surprise because training big teams like military units or headquarters have only value in life-threatening crises which are rare in day-to-day business life. Real life situations are considered as sufficient to ‘train’ a team in handling a routine production job. There is no need for extra training for a rare situation; lives do not depend on it, only jobs.

There are some team taxonomies and maturity models out there, but these are focussed on the behaviour or development status of teams and not on guiding collective training.

Even studies in the military realm are rare. The few found concerned highly specialized teams which are out of the scope of this document. This lack of studies may be caused by the tendency of the military to limit internal publications.

Observations

The long history of collective training in the military gave shape to the current situation. A taxonomy should somehow take the acquired ‘general knowledge’ on collective training into account. This knowledge is observable during the planning and execution of collective training.

While small tactical teams go through rigorous training schemes by repeating the execution of tasks in certain situations over and over, big headquarters at the strategic level rarely train as a team. The main differences between these two extremities of the team continuum are:

1. The time to complete (a part of) an OODA-loop³;
2. The complexity and amount of information to be analyzed before deciding;
3. The direct threat of loss of lives of team members or others involved.

This observation brings us to the question: Why do we train collectively? The main aim is to be effective in the execution of a collective task within a given timeframe and to increase the

³ OODA loop stands for Observe, Orient, Decide and Act and was invented by USAF Col John Boyd.

speed of execution. Only if the set of (sub)tasks must be executed in parallel is there a need to collectively train. In that case, training provides each member with a better understanding of what is expected, when it is expected, and to whom the output should be given and builds trust amongst the members in the output of others.

Another observation is that although individual performance is a necessary condition for team performance, the team performance level does not necessarily improve by education and individual training. The idea that a certain level of team performance must be matched by a similar level of individual performance is incorrect. A group of experts does not necessarily makes an expert team.

Figure 3 displays the different types of team training according to two axes: unit⁴ and task. The Task-axis distinguishes between a general approach to tasks that are valid for the majority of the teams; and specific tasks that are to be executed by the team at hand. The second, the Unit-axis also distinguishes between a general unit meaning that the participants are not members of the same team but may be different members of similar teams; and a specific unit, the actual team.

		Unit	
		General	Specific
Task	General	(GT-GU) Education on interpersonal communication, team skills, leadership, ...	(GT-SU) Collective activity to increase team coherence like team building day, solving general problems, ...
	Specific	(ST-GU) Individual training of a real task in a temporary group like a simulation, a workshop, ...	(ST-SU) Collective training on a task that needs to be performed

Figure 3: Types of Team Training

⁴ The term 'Unit' is used instead of 'Team'.

The combination of those two axes gives four types of team training:

1. General Task – General Unit (GT-GU) training is the type that educates and trains individuals in the skills and aptitudes to work as a team member. It provides them with generally applicable knowledge and skills to function within a team. This kind of training can include simulated team exercises. Example: general team training for Staff Officers.
2. Specific Task – General Unit (ST-GU) training focusses on specific tasks the trainees have to perform as part of a team. These tasks are normally limited in scope and within the set of tasks to be executed by the participants within their future team. As with the GT-GU, this kind of training is focussed on the individual and not considered as collective training. Example: training of logisticians to work as a member in a logistics branch.
3. General Task – Specific Unit (GT-SU) training aims to build a specific team out of a group of skilled individuals. The purpose is not to execute the tasks that are part of the job, but to create a team that can handle unforeseen situations through better mutual understanding. Although the tasks are not necessarily work related, the participants are the actual members of the team. Example: a team building exercise for the members of an existing logistics branch.
4. Specific Task – Specific Unit (ST-SU) training prepares a team for an optimum performance of the tasks to be performed by that team. Normally this is done under the supervision by the team leader by (re)executing the tasks until the right output is produced, and then repeating everything again to make sure that there is some sort of automatism. Although GT-SU training can be considered as such, ST-SU is what collective training is really about.

Building the Taxonomy

The first idea for a Team Performance Taxonomy was inspired by the Bloom taxonomy for education and individual training. A simple transposition to collective training did not suffice to explain the number of training activities needed to reach a certain level. The complexity of the collective task at hand, the basis for the Bloom taxonomy, results in a contradiction with the observation of the diminishing training activities from tactical to strategic level.

The second taxonomy considered the impact of time (or speed of decision) and complexity in a simplistic way: the most difficult factor determined the level. Although this combination

improved the taxonomy by mirroring the observation closer, it did not explain in a satisfactory manner the tactical-strategic contradiction.

A Team Performance Taxonomy for Collective Training

The third taxonomy combines the speed of decision and complexity in such a way that both vary independently, but the combination indicates the level within the taxonomy. This is represented by the two lines under the proposed taxonomy of Figure 4. The levels of Team Performance in the taxonomy are ordered from 'aaa' to 'eee' to differentiate with the 100 to 500 levels used on the individual site while keeping a recognizable similarity. For every level, the taxonomy provides the following information to identify the performance level:

- Team member Interactions. The higher the performance level of the team, the more complex and mature the nature of the interactions between the team members are.
- Command and Control of lower units/HQs. As a team (i.e. headquarters) increases its performance level, it will be able to command and control units (or HQs) at subordinate levels. The assumption is that an HQ can only command and control (C2) a subordinate HQ or unit at the same or lower level. It seems hard for an HQ to use a C2 style towards lower echelons that the HQ itself as a team has not mastered yet.
- Procedures. Gives the level and nature of the procedures used/needed by the team to function at that level.
- Internal feedback and communication. This is a reflection of the level of interactions between team members.
- Education & Training. The way the team learns.
- Possible Methods of Collective Training. Suggestions of methods to maintain or improve the level of performance.

The necessity to raise the level of performance, and thus the number of collective training activities of type ST-SU, is normally a combination of increased complexity and speed⁵. This can be expressed by

$$n_{CT} = f(\text{Training Performance Level}) = k_1(C_2^{k_2}S-1)$$

⁵ Teamwork necessary to increase quality and/or creativity are not considered a base for collective training events as defined here.

with n_{CT} as the number of Collective Training activities, k_1 and k_2 as constants, C for Complexity and S for Speed of Decision.

The formula (see also the graphical representation of Figure 5) does not provide an exact number of training activities but a general guideline. It is clear that the need for speedy decisions drives the number of training activities. The higher the need for speed, the higher the number of activities to reach the desired level. The formula also indicates that when speed is of no importance, there is no need to collectively train.

Complexity has a much lesser impact on the number of training activities. This conforms to the tactical-strategical observation.

Figure 4: The Proposed Taxonomy for Collective Training

		Team Proficiency Level				
		(aaa) Individualized	(bbb) Programmed	(ccc) Integrated	(ddd) Proactive	(eee) Intuitive
	Team member Interactions	Non-existent, must still be developed	Limited to what is written and based on general knowledge and experience with previous teams	Interactions are executed in an integrated manner as foreseen in procedures	Integrated interactions as foreseen, but adapt to small changes	Intuitive interactions to new situations
Characteristics	Command and Control of lower units/HQs	Not possible	Detailed Tasking	Tasking	Objectives that are translated in tasks	Mission Command
	Procedures	External detailed procedures	Mostly external procedures	Developing own detailed procedures	Own procedures for known situations	Own, flexible procedures
	Internal feedback and communication	None	Limited capability to reflect procedures, structures, and tasks	Capability to reflect on own processes, structures, and tasks; elementary LL process	Capability to contribute to and implement LL processes	LL Processes (including subordinated entities)
	Education & Training	Copy, completely dependable on external E&T	Follow given instruction, mostly dependable on external E&T	Educate and train staff to absorb changes in personnel	Educate and train to absorb big turnover of personnel and aughtees	Educate and train to adapt to new situations and missions
	Possible Methods of Collective Training	E&IT	Collectively run through procedures, Cross-Functional Training, BST, KLT, Demos, Role Play	BST, AAR, FTX, KLT, Group Simulations, Field Trip	FTX, Group Simulations, Group Gaming, Field Trip, Guided Discussions	FTX, Group Gaming, Group Discussions
Complexity	Command and Control by higher HQ	Detailed Tasking	Tasking	Objectives that are translated in tasks	Mission Command within certain limits	Mission Command
	Environment	Unilateral	Multiple environments (limited number and complexity)	Multiple (moderate complex) environments	Increasingly complex environments	Complex Environments
	Forces	Single Service, single nation	Single Service, Combined	Joint and Combined	Joint, Combined, with substantial contribution by partners	Joint, Combined, partners and Interagency
Speed	Speed to complete the OODA loop for the task at hand in the time available	Speed is not the driver	Step by step as there is ample time to decide and execute	Routine like speed as task must be executed under normal time restraints	High speed	Quasi-instantaneously from observation to executed action

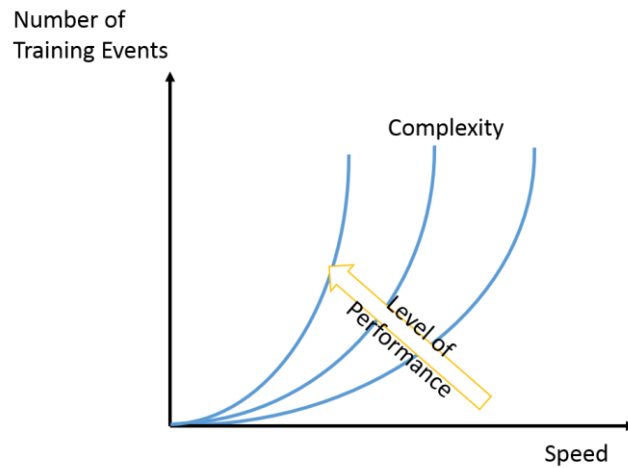


Figure 5: Graphical Representation of the Impact of Speed and Complexity on the Number of Collective Training Activities.

As mentioned above, there are 4 types of team training. The use of the other 3 types influences positively the constants k_1 and k_2 . These constants can also be reduced by the experience of the members with working in other teams, the experience of the team in other tasks (comparable to the GT-SU type of training) and, of course, real life experience (i.e. operations). Although the latter can greatly increase the team performance level, as observed during an HQ in an operation, this approach is not a valid collective training option.

The taxonomy offers other insights. The first taxonomy based on Bloom, i.e. the one currently used in the Training Requirements Analyses, suggests that for a team to reach for example a ‘400’ level in team performance, all members should perform at the comparable 400-level on an individual basis. This is in contradiction with the observed connection between the individual and collective level. The link with education and individual training is through the ‘aaa’ level; this underlines the basic idea of the NATO Training Spectrum that individual preparation is a necessary but not a sufficient condition for collective performance. It also does not lead to the wrong conclusion that more individual training leads to increased team performance.

Although the taxonomy may suggest that a team performs at a certain level, the reality is not that simple. A bit like Bloom’s Taxonomy, the real level of a team will be a mix of the execution of collective tasks at different performance levels. To master a new task, a well-oiled team needs collective training, but the number of training activities will be fewer than a less-mature team.

Although the taxonomy is intended to be used during the Training Requirements Analysis within one discipline, i.e. a collection of similar and related education and training requirements, most teams will be working in an interdisciplinary manner. This is observed on most Collective Training activities and Exercises, although there are exceptions (e.g. a Logistics Exercise, Nuclear Training). Nevertheless, like a team is a mix of different levels, the levels within a team may be different over the different disciplines. The taxonomy should be used with this in mind.

The highest level is not the ideal level of performance for a team. The higher the level, the more collective training is needed to attain and sustain it. The need for speedy decisions and the complexity of the environment should be the driving factors in the determination of the appropriate level, resulting in the necessary investment in collective training, not the simple aspiration to have a high-level team.

Conclusions

The proposed Team Performance Taxonomy for collective training goes away from the similarity with Bloom's Taxonomy for Knowledge and Skills. It satisfies the observations of current practices in collective training and relates the training effort to the desired speed of decision and the complexity of the environment wherein a team is working. More collective training is needed for teams working in complex environments and in need for shorter OODA-loops.

The use of this taxonomy during the Training Requirements Analysis requires of the analysts to look in a different way at team performance and questions the practice of using the same requirements on the individual and the collective side of the NATO Training Spectrum.