

LEARNING TO EVALUATE MULTIDISCIPLINARY CRISIS- MANAGEMENT TEAM EXERCISES

Marcel van Berlo¹

TNO Defence, Security and Safety, the Netherlands

Richard van Dommele², **Piet Schneider**³, **Inge van de Veerdonk**⁴, **Erie
Braakhekke**⁵

Police Academy of the Netherlands, the Netherlands

Nienke Hendriks van de Weem⁶, **Erwin van Dijkman**⁷

COT Institute for Safety, Security and Crisis Management, the Netherlands

Sjoerd Wartna⁸

Netherlands Institute for Physical Security – NIBRA, the Netherlands

Keywords

Training, exercises, crisis management, evaluation, best practice, multidisciplinary teams

Abstract

Training of multidisciplinary crisis management teams is becoming more common practice. Nevertheless, the value of these trainings and exercises is questionable. Scenarios are quite often realistic and challenging to the trainees: the team members are heavily engaged in doing their jobs in a multidisciplinary context. But the degree to which they can really learn from these experiences depends on more than just the realism. The training situation may be too complex or hectic to get a good understanding of the team's performance. A solid evaluation afterwards is therefore of utmost importance. However, an effective evaluation requires expert-evaluators. In many cases evaluators are themselves experts in the field of crisis management. But that does not automatically guarantee them to be expert-evaluators. They need to be able to not only observe and diagnose the team's performance (with respect to taskwork and teamwork), but also to give feedback in an effective and structured way, and to guide the team in their evaluation process. Improving the competencies of evaluators is therefore conditional for increasing the effectiveness of multidisciplinary exercises from a

¹ P.O.Box 23, 3769 ZG Soesterberg, The Netherlands

T: +31 346 356 254, E: marcel.vanberlo@tno.nl

² P.O. Box 1201, 7301BL Apeldoorn, The Netherlands

T: +31 654 923 412, E: Richard.van.Dommele@politieacademie.nl

³ T: +31 612 233 563, E: piet.schneider@politieacademie.nl

⁴ T: +31 555 392 254, E: Inge.van.de.Veerdonk@politieacademie.nl

⁵ T: +31 614 499 634, E: erie.braakhekke@politieacademie.nl

⁶ Koninginnegracht 26, 2514 AB The Hague, The Netherlands

T: +31 703 122 038, E: n.hendriksvandeweem@cot.nl

⁷ T: +31 703 122 037, E: e.vandijkman@cot.nl

⁸ T: +31 263 552 400, E-mail: sjoerd.wartna@nifv.nl

learning perspective. Supported by the Dutch Home Office, we developed a six-day course combining practical experience and results of scientific research. In three blocks of two days, the trainees learn more about observing multidisciplinary team performance, conducting an evaluation with the team, and writing an evaluation report. Hands-on experience is combined with short theoretical reflections. Afterwards, the trainees follow an interactive examination during which their performance is assessed by two independent examiners. Up to now, three courses have been conducted. Every course is evaluated based on which the next course is improved. Trainees come from first responder organizations, the military and other organizations (e.g. municipality). In the paper we will describe the structure and contents of both the course and the examination, and share our experiences.

Introduction

Technological developments have resulted in more sophisticated and complex systems in which humans have to operate. These systems are characterized by a highly dynamic and sometimes hostile environment, the variation of (often conflicting) goals, the incompleteness, uncertainty and ambiguity of information, and the involvement of teams of officers with members having different roles and responsibilities (Rouse, Cannon-Bowers & Salas, 1992). In these situations, many tasks are conducted by multidisciplinary teams. Crisis management teams are characterized by these descriptions. Because crisis management teams have to operate in critical situations affecting the life and well-being of many citizens, it is important that these teams can perform their tasks in a competent way. Team performance is affected by many different variables, both within the team itself and in the organizational and operational context. Therefore, training cannot be the sole contributor to enhance team effectiveness. But carefully identifying and analyzing the variables affecting team performance, and taking into account these factors in the process of instructional systems design, will probably positively impact the effectiveness of the team training (Van Berlo, 2005).

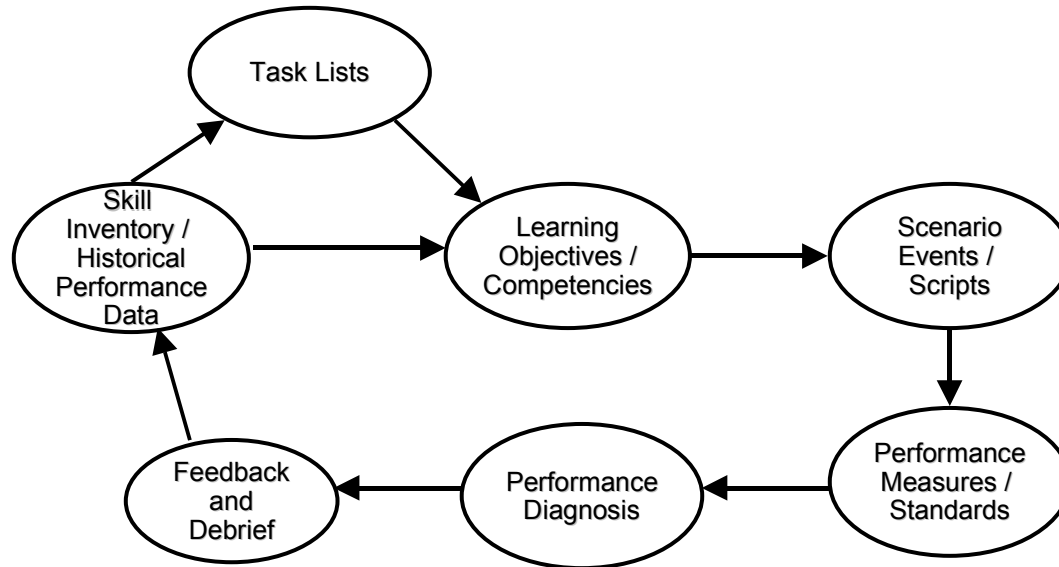
Training of multidisciplinary crisis management teams is becoming more common practice. Nevertheless, the value of these trainings and exercises is questionable. Scenarios are quite often realistic and challenging to the trainees: the team members are heavily engaged in doing their jobs in a multidisciplinary context. But the degree to which they can really learn from these experiences depends on more than just the realism: the training situation may be too complex or hectic to get a good understanding of the team's performance. A solid evaluation afterwards is therefore of utmost importance. However, an effective evaluation requires expert-evaluators. In many cases evaluators are themselves experts in the field of crisis management. But that does not automatically guarantee them to be expert-evaluators. They need to be able to not only observe and diagnose the team's performance (with respect to taskwork and teamwork), but also to give feedback in an effective and structured way, and to guide the team in their evaluation process. Improving the competencies of evaluators is therefore conditional for increasing the effectiveness of multidisciplinary exercises from a learning perspective. Supported by the Dutch Home Office, we developed a six-day course and an interactive exam combining practical experience and results of scientific research. In this paper we will describe the structure and contents of both the course and the examination, and our experience so far. Firstly, the theory behind multidisciplinary team training is briefly explained. In the following two sections we describe the structure and contents of both the course and the exam. Next the findings so far are described and we conclude with a discussion.

Theory and method

It becomes increasingly clear that just putting together a team of individual experts does not make an expert team (Salas, Cannon-Bowers, & Johnston, 1997). In recent years, it has been shown that a good approach to training teams with complex training technology is linking training goals to events in training scenarios in a controlled fashion. This is called the 'event-

based approach to training' (EBAT: see Figure 1) (Hall, Dwyer, Cannon-Bowers, Salas & Volpe, 1993; Cannon-Bowers, Burns, Salas & Pruitt, 1998).

Figure 1. The EBAT framework (cf. Cannon-Bowers, Burns, Salas & Pruitt, 1998, p. 366).



The EBAT framework starts at the top left hand side with the tasks to be performed by the team. The basic assumption is that training should provide opportunities for practice, enabling a team to develop critical competencies to conduct their mission, or, to manage an emergency. The team and individual behavior indicating these competencies is explicitly described in the learning objectives. Based on these learning objectives, the training scenario is developed. A training scenario consists of several events that are specifically designed to trigger the team members' behavior as described in the learning objectives. Events are critical incidents that can occur during the course of the emergency and on which the team is supposed to react. For every event, the observers know what behavior the team should demonstrate, and which prototypical mistakes could be made. This facilitates a systematic observation of the team members' behavior. Based on these measurements the training staff is able to make a valid diagnosis of the performance and to assess to what extent the learning objectives have been achieved. During the debrief, feedback is provided to the team and, together with the team, the lessons learned are formulated. The strength of EBAT is the systematic linkage among these components. Without this linkage it is impossible to ensure that team members will have learned anything from the training.

Performance measurement, diagnosis and providing feedback are essential elements to support the learning process the team needs to be engaged in. Although technology can be supportive in this respect, the competence of the human evaluator is critical. Guided by the instructor the team members reflect on the team's performance, discuss which actions have been conducted, why certain choices and decisions have been made and which improvements can be made. In this way, a critical function in the team's learning process can be realized: reflecting on the own behavior in order to gain a deeper understanding of the characteristics of effective team performance. The reflection is primarily aimed at the instructional objectives and the execution of the training scenario (Van Berlo, 2005).

The partners in our project team have various backgrounds, covering the fields of operational crisis management, instructional design, organizing and evaluating exercises, and research on real-life crises and team training. Based on our practical and theoretical experience, we defined the competencies expert evaluators need to have in our view. As a prerequisite, they

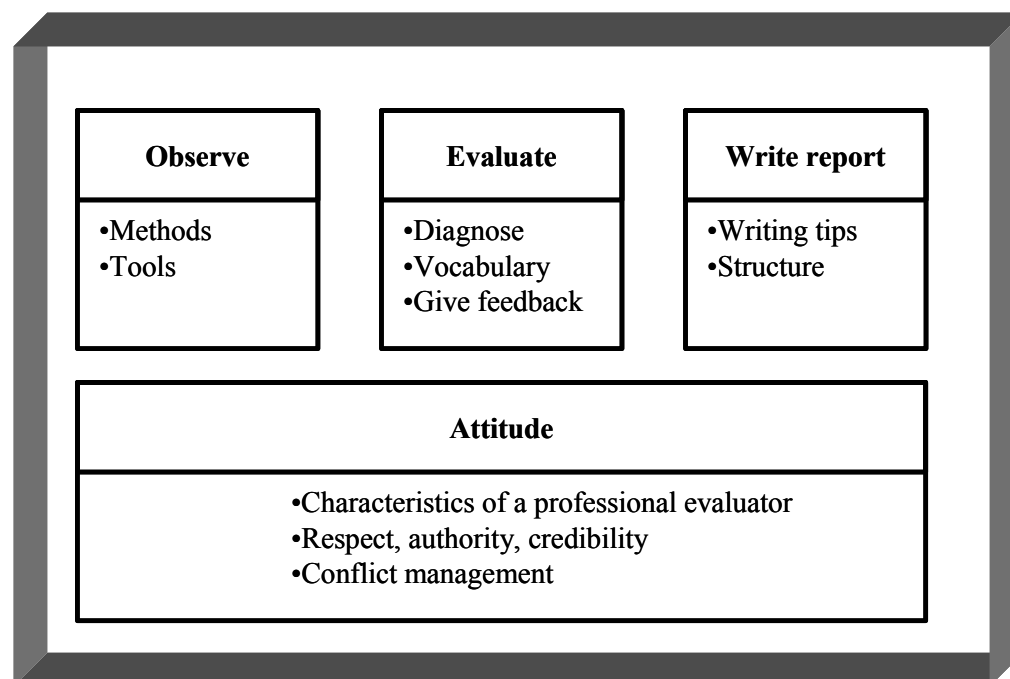
need to have basic knowledge of the structures and processes within multidisciplinary crisis management organizations. They also need to be able to observe multidisciplinary teams, and diagnose their processes and performance. Based on the observations and diagnosis, they should give feedback to the group in two ways: a) directly to the team during a guided discussion, and b) afterwards in a written report. The evaluator must be able to handle resistance from the team and give the feedback in a respectful matter. In the following sections we will describe the structure and contents of both the course and the exam.

Structure and contents of the course

Supported by the Dutch Home Office, and with the Dutch Police academy as project manager, we developed a six-day course. In three blocks of two days, including an evening program, the trainees learn more about observing multidisciplinary team performance, conducting an evaluation with the team, and writing an evaluation report. Hands-on experience is combined with short theoretical reflections. One or two core instructors are responsible for most of the lectures and exercises; guest-instructors and role-players are scheduled on more specialized topics.

The four building blocks, upon which the course is based, are 'observe', 'evaluate', 'write evaluation report' and 'attitude' (see Figure 2). These are the four pillars that we believe form the base that good evaluators need. All the competencies or knowledge that we want the trainees to acquire, are placed within one of these blocks.

Figure 2. Structure of the course on learning to evaluate multidisciplinary teams.



In the block 'Observe', we treat the theoretical topics of human biases in observations, as well as non-verbal communication and group dynamics, e.g. team roles (Belbin, 1996), and influence techniques (Forsyth, 2006). We share tips and tricks in making observation notes and practice frequently with observing different situations. In the block 'Evaluate' trainees learn the basic rules of giving and receiving feedback, and human interaction processes (Remmerswaal, 2003; van Dijk, 2000). We pay attention to personal styles and how to handle conflicts with(in) teams. The trainees practice frequently with different feedback situations. In the block 'Write report' we focus on writing an evaluation report: what is a good way to

describe the entire performance of a multidisciplinary crisis management team in a report and how does this relate to the training objectives? And how do you come to a conclusion in a logical and understandable manner? The so-called OAOA-method (a Dutch acronym for Observe-Analyze-Judge-Recommend) has found to be helpful in this respect. The blocks described so far reflect three key competencies of an evaluator. A prerequisite however, is a professional attitude of the multidisciplinary evaluator. This relates to the way the evaluator sees his own role in the whole process of improving the performance of crisis management teams during training and exercises. The multidisciplinary factor requires them to gain knowledge about all relevant organizations. And last but certainly not least, we stress the importance of respect, authority and credibility.

In the course, we integrate these four blocks by combining theoretical blocks with frequent practices. For instance, at the start of the course trainees practice their observation and writing skills based on DVD-recorded team actions. Trainees engage in role-playing situations (both with fellow trainees and professional role players) and practice feedback skills. At the end of the course, trainees observe a real-life exercise of the Dutch police force or the military, giving them an opportunity to practice in a realistic operational setting.

Trainees bring in a variety of operational expertise, cultural differences, and training experiences. For instance, the police evaluates real-life large-scale operations with specific evaluation teams, but gives the feedback only to the overall commander. The fire brigade particularly has experience in evaluating training and exercises. The military has, in general, a more formalized way of conducting evaluations mainly focused on procedures. In order to promote gaining knowledge about other disciplines in the crisis-management organizations, several group activities and an evening program are included in the course. This gives trainees (also informal) opportunities to exchange knowledge and expertise, learn from each other's difficulties, and get a better understanding of each roles and positions. Combined with the fact that the core-instructors guide and coach the trainees, a safe learning environment is established.

Structure and contents of the exam

After the course a competence test takes place. A competence test is an instrument with which trainees can demonstrate the acquired competencies and is a standard way of concluding a course at the Dutch Police academy. Proven competence results in a formal qualification. The trainee has to perform successfully during his assignment in order to be qualified in his day-to-day practice. Competence tests are developed and determined by a development group, consisting of faculty teachers, operational experts and specialists, and a developer of competence tests from the Examination Board of the Police Academy. This development group determines the content and form of the test. A competence test contains one (or more) assignment(s), which is (are) described and provided with assessment forms (checklist) and explanatory notes.

According to the Examination Board, a valid competence test must be competence-based and as realistic as possible. That is why the development group often chooses a work sample test to assess the competences of the student. In this case, however, this was not possible because the expert-evaluators can only do their activities when qualified. Therefore, we developed a simulation in order to assess the trainees. A competence test must also be reliable. This means the assignment needs to be standardized. For this purpose, we used several scripted scenarios for the simulation. These scenarios describe the interaction within a multidisciplinary crisis management team and were played by professional role players. The performance of this team is recorded on DVD. During the exam, the trainee watches the DVD, observes the team (as if he was present at the exercise) and prepares for the feedback session. He is then taken to a separate room in which the particular team members (the same role-players as on the DVD) are ready for the actual feedback session. In this 20 minutes interactive session, the trainee gives the feedback to the team members who play their scripted roles. Finally, the trainee writes the evaluation report.

Two independent assessors observe and assess the trainee's performance. The assessors are observation and evaluation specialists, do not teach during the course, and are trained in assessing trainees following the regulations of the Examination Board. They use a standardized assessment form with several criteria (see table 1). The trainee passes the competence test when he scores positively on all four crucial criteria and at least two of the non-crucial.

Table 1. Format of the assessment form.

1.	Conducting the evaluation	
1.1	Give effective and constructive feedback	Crucial
1.2	Reflect on contents of teams' performance	Crucial
1.3	Actively involve the team in the evaluation	Crucial
1.4	Authority	
1.5	Credibility	
1.6	Respect	
2.	Writing the evaluation report	
2.1	Content	Crucial
2.2	Structure	

The quality of 'conducting the evaluation' is assessed immediately after the trainee has finished the feedback session. The assessors consult the role-players to get a better understanding of how they have perceived the students' performance. On a later moment, the same assessors evaluate the report. When the student passes his assignment, he receives his certificate from the Examination Board of the Police-academy.

Findings

Empirical validation of training interventions is an essential step. Empirical research is needed in order to formulate theoretically sound and validated design specifications. Because of the practical nature of Instructional Design research, this research should have ecological validity (Elen, 1995). This ecological validity is achieved, as much as possible, in a naturalistic environment and by conducting design experiments. A design experiment focuses on engineering innovative educational environments and simultaneously conducting experimental studies of those innovations (Brown, 1992). It is an empirical study in which instructional support is designed, implemented, validated and revised in an iterative, recurrent way (Brown, 1992; De Corte, 2000). And that is what we have done during the cycle of three courses so far.

After every block of two days, there was plenty of opportunity for trainees and teachers to reflect on contents and structure of the course. After the last day, they all engaged in an interactive evaluation discussion. The topics of the course, the relations between the topics, the intensity of the course, the quality of the teachers, the homework, the exercises and role plays: everything has been discussed in an open atmosphere with the intention to improve the course's quality. After all exams of a course, the assessors and role-players have a good picture of the extent to which the trainees master the competencies. These experiences are fed back to the core instructors who determine, together with the teachers, how these experiences relate to the objectives and contents of the course. In this way we continuously checked how

we could better help the trainees in achieving the training objectives and improve the quality of the course while at the same time maintaining the high quality standards of the exam.

All trainees indicated the course as 'very intense'. An explanation is that the focus of the course is not only the topic 'evaluation' or the roles of other disciplines, but also the attitude of the trainee. Conducting many practical exercises, receiving and giving personal feedback, has been perceived of as useful learning moments. A safe learning environment is therefore of paramount importance. Making mistakes was accepted, discussions were respectful, and everybody was keen on helping the others in improving their competencies. In the periods between the course blocks, trainees indicated that they practice what they have learned. This was not only related to their tasks as evaluators during exercises, but also to other tasks like for instance evaluating real-life incidents and personnel management. The exam, with professional role-players, is perceived of as realistic, dynamic and difficult. Trainees have the experience of giving feedback to a real team and that you really have to earn the certificate. That is reflected in percentage of trainees that eventually pass the exam: during this pilot phase, about 30% of the trainees does not pass.

Finally, everyone appreciated the various disciplinary backgrounds of the trainees. This stimulated a multidisciplinary view on crisis management and that is of course essential for evaluating multidisciplinary teams.

Discussion

In this paper we have described the structure and contents of both the course and the examination, and shared our experiences. Up to now, the course has been conducted three times. Every time the course is evaluated based on which the next course is improved. It is, at least in The Netherlands, one of the first courses specifically aimed at learning to evaluate multidisciplinary crisis-management teams. Besides, the target group itself has a multidisciplinary background as well: trainees come from first responder organizations, the military and other organizations like for instance the municipality.

Conducting evaluations is a profession in its own. The Dutch Home Office has to intention to form a pool of crisis evaluators at a national level. The course alone is just one step in creating a more professional community of evaluators. We are now beginning to form a pool of professional evaluators that can and will be assigned to several (large-scale) multidisciplinary crisis-management exercises. More and more crisis management organizations are getting convinced that these certified evaluators really have an added value: we already received over one hundred calls for participation to the course. In this way it would be possible to have several evaluators in every single newly formed safety regions in The Netherlands. Having a national pool of professional evaluators can also stimulate the regions and its organizations to organize and conduct multidisciplinary trainings and exercises. It is a guarantee that you will have a solid evaluation afterwards, increasing the degree to which teams can really learn from these exercises. Several former trainees are currently also part of an evaluation team engaged in two big infra-structural projects, assessing the newly formed crisis-management organization structure in a series of exercises.

Expanding the knowledge base and increasing the competency level of the evaluators is a continuous effort. This can be facilitated by practical experiences as evaluators, but also by critically reflecting upon your own behavior as an evaluator, together with peers. We are now in the process of organizing these group reflection sessions, and also to integrate the evaluators' experiences into the next courses. This course gives a good and firm basis for evaluating multidisciplinary teams in the crisis management organization. Nevertheless, the crisis management system in The Netherlands is still a complex system, consisting of many different organizations at various levels: operational, tactical and strategic, as well as local, regional, national and international. Besides the more general competencies as trained in this course, other competencies may be required for conducting evaluations at specific (combinations of) levels. One example could be setting up and leading a large,

multidisciplinary evaluation team. Together with the Dutch Home Office, we will define these competencies and determine if these need to be integrated within the existing course or that additional courses need to be developed.

Large crisis management exercises often involve many teams that are distributed in the area. As the teams and team members are not physically on the same location, performance measurement and providing feedback can be problematic. In order to give adequate feedback, it is essential that observers, who are distributed themselves as well, can quickly compare and integrate their observations. In this way, the time needed to prepare the evaluation session can be reduced to a minimum. The sooner the results of an exercise can be evaluated, the better it is. For this reason, a group of former trainees has experimented with a mobile performance measurement and evaluation tool, specifically developed for distributed team training (Van Berlo, Hiemstra & Hoekstra, 2003). This tool on a tablet-pc (MOPED) helps the evaluators in observing team performance and in quickly generating, sending and receiving data to support the evaluation. Given the rapid technological developments, we expect that during crisis management training and exercises, evaluators will use these tools and support more and more. It is therefore important to get a clear picture of how the training staff should be supported in doing this, how this affects the competencies of evaluators and how they can best be prepared for this.

References

- Belbin, M. (1996). *Team roles at work*. Oxford: Butterworth-Heinemann.
- Brown, A. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of the Learning Sciences*, Vol. 2, No. 2, pp. 141-178.
- Cannon-Bowers, J.A., Burns, J.J., Salas, E., & Pruitt, J.S. (1998). Advanced Technology in Scenario-Based Training. In: J.A. Cannon-Bowers & E. Salas (1998) (Eds.). *Decision Making under Stress: Implications for Individual and Team Training*. Washington, DC: American Psychological Association.
- De Corte, E. (2000). Marrying theory building and the improvement of school practice: A permanent challenge for instructional psychology. *Learning and Instruction*, Vol.10, pp. 249-266.
- Elen, J. (1995). *Blocks on the Road to Instructional Design Prescriptions: A Methodology for I.D.-Research Exemplified*. Studia Paedagogica. Leuven University Press.
- Forsyth, D.R. (2006). *Group Dynamics (4th edition)*. Wadsworth Publishing Company.
- Hall, J.K., Dwyer, D.J., Cannon-Bower, J.A., Salas, E., & Volpe, C. (1993). Toward Assessing Team Tactical Decision Making Under Stress: The Development of a Methodology for Structuring Team Training Scenarios. *Proceedings of the 15th Annual Interservice/Industry Training Systems and Education Conference* (pp. 87-98). Washington, DC: National Security Industrial Association.
- Remmerswaal, J. (2003). *Handbook of group dynamics (in Dutch)*. Nelissen.
- Rouse, W.B., Cannon-Bowers, J.A., & Salas, E. (1992). The Role of Mental Models in Team Performance in Complex Systems. *IEEE Transactions on Systems, Man, and Cybernetics*, Vol. 22, No. 6, pp. 1296-1308.
- Salas, E., Cannon-Bowers, J.A., & Johnston, J.H. (1997). How Can You Turn a Team of Experts into an Expert Team?: Emerging Training Strategies. In C. Zsombok & G. Klein (Eds.), *Naturalistic Decision Making*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Van Berlo, M.P.W. (2005). *Instructional Design for Team Training: Development and Validation of Guidelines* (Doctoral Dissertation). Enschede: Print Partners Ipskamp.

Van Berlo, M.P.W., Hiemstra, A.M.F. & Hoekstra, W. (2003). Supporting observers during distributed team training - the development of a mobile evaluation system. *Proceedings of the NATO Symposium on Advanced Technologies for Military Training*. October 13-15, 2003, Genoa, Italy.

Van Dijk, B. (2000). *Change others, start with yourself. On behaviour and the rose of Leary* (in Dutch). THEMIS: Mens en bedrijf.

Acknowledgements

We would like to thank all trainees, teachers, role-players and assessors. Without their valuable feedback we would not have been able to improve the structure and contents of both course and exam.

Author Biographies

Marcel van Berlo holds a PhD in Instructional Psychology and Technology and is researcher on training and instruction. He has experience in the design, execution, and management of research projects in the field of military training, crisis management, instructional design, team performance measurement and feedback, and designing innovative team training environments. Within TNO he is also business developer on human factors related to public safety and security.

Richard van Dommele is crisis management consultant within the Dutch police. He has various experiences in large-scale crises and special events, both as a staff officer and as commander of operational evaluation teams (ranging from outdoor mass events to large-scale riots, kidnappings and summits). He is one of the developers of the new crisis management structure of the Dutch police and is member of the multidisciplinary team developing a crisis management plan for the new national safety regions.

Piet Schneider is currently consultant and trainer at the police academy after 32 years of operational experience as an officer. He has various experiences with large-scale crises and special events, both as commanding and staff officer. He is program manager for the evaluation course described in this paper and is responsible for assigning evaluators to large exercises. He also manages several projects the police academy conducts with other organizations, related to safety, security and crisis management.

Inge van de Veerdonk holds a master's degree in educational science and develops competence tests for the Police Academy of the Netherlands. She has several years of experience in researching the field of adult education and in designing competence-based educational and examination programs.

Erie Braakhekke holds a master's degree in pedagogy. She is trainer and consultant within the domain of public order and conflict management at the Police Academy of the Netherlands.

Nienke Hendriks van de Weem holds a master's degree in social psychology and is a trainer and consultant. Within COT, she organizes and evaluates crisis-management trainings for governmental and private organizations, both at an operational and strategic level.

Erwin van Dijkman holds a master's degree in policy science and within COT he is director organization development, education and training. He advises key decision-makers and strategic crisis management teams within governmental and private organizations, and evaluates their performance. He also develops innovative training formats for crisis management.

Sjoerd Wartna holds a master's degree in environmental biology and has a multipurpose background in advising, education, product development and training in crisis management. From 2004 he has been project manager for a train-the-trainer course for multidisciplinary trainers. As a trainer, his working area in crisis management varies from training governmental teams to crisis teams in the Critical Infrastructures.