ORIGINAL ARTICLE

Cultivating a longitudinal learning process through recurring crisis management training exercises in twelve Swedish municipalities

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Abstract

This study illustrates how crisis management capability is developed in series of recurring exercises, rather than in one single exercise. Over one hundred table-top and role-playing exercises were performed and evaluated in a longitudinal cross-case action research study in 12 Swedish municipalities. By consciously adapting training formats, municipalities were lead through three learning phases: obtaining role understanding (phase 1: knowing what to do), developing information management skills (phase 2: knowing how to do it), and mastering self-reflection in regular time-outs (phase 3: knowing when and why to do something). This final learning outcome, being able to concurrently execute, evaluate, and reorganize an ongoing crisis management performance, may be the most valuable capability of a crisis management organization when crisis strikes.

KEYWORDS
crisis management, exercise, gaming, gaming simulation, learning, Sweden, training

1 | INTRODUCTION

Teaching and training crisis management is challenging (Borodzicz & van Haperen, 2002; Lalonde & Roux-Dufort, 2013). Crisis management training exercises are one available tool for teaching and training crisis management (Borodzicz & van Haperen, 2002; 't Hart, 1997; Lalonde & Roux-Dufort, 2013). There has been a long-standing debate on how to properly design exercises (Borodzicz & van Haperen, 2002; de Caluwé, Geurts, & Klein-lugtenbelt, 2012; 't Hart, 1997; Hofstede, de Caluwé, & Peters, 2010; Wenzler, 2009), on whether the right skills and capabilities are trained (Boin & Lagadec, 2000; Robert & Lajtha, 2002; Borodzicz, 2004; Scholtens, 2008; Hansén, 2009; Lalonde & Roux-Dufort, 2013), and on what participants actually learn (Berlin & Carlström, 2015a; Borodzicz & van Haperen, 2003; Donahue & Tuohy, 2006; Editor, 2005; Hofstede et al., 2010; Perry, 2004). Researchers have repeatedly highlighted the need for more

detailed empirical accounts of the usefulness of crisis management training exercises (Berlin & Carlström, 2015a; Editor, 2005; Hofstede et al., 2010; Perry, 2004).

This article presents empirical findings from the design, performance, and evaluation of 140 crisis management training exercises across 12 Swedish municipalities under a 10 year period. Most research on crisis management training exercises discusses the design or usefulness of a single exercise. In contrast, our study highlights the value of organizing series of exercises to evoke long-term organizational development. Our analysis explains how learning needs, training formats and techniques, training content, and training outcomes are interrelated and how they evolve in concert over time through three development phases:

1. Gaining role understanding;
2. Developing skills and practices;
3. Mastering self-evaluation and adaptation.

1.1 | Training crisis management with gaming simulation

Crisis management training exercises aim to prepare crisis management professionals on how to perform in the event of a crisis. Training facilitators and researchers discern between different types of exercises (Donahue & Tuohy, 2006; Kim, 2014; Perry, 2004). For example, table-top exercises are discussion exercises where participants sit together in one room and give *verbal accounts on how they would intend to act* given a scenario presented by exercise facilitators. Alternatively, full-scale role-playing exercises aim at training the *actual real-time performance* of collaborative practices under realistic conditions. Benefits of crisis management training exercises are ('t Hart, 1997; Hermann, 1997; Kleiboer, 1997) as follows:

- The closest crisis managers and their support staff can get to a real crisis
- A unique way of experiencing and understanding the crux of complex social phenomena (like organizational crisis management) as a contextual whole, that is how the dynamic interaction between events, actions of various stakeholders, and feedback loops unfolds in the natural (work) environment
- Enabling "learning by doing" instead of passive listening
- An opportunity to fail and try again, that is as situations can be replicated, different strategies can be explored, and rich feedback can be obtained on the pros and cons of these strategies
- Facilitating the transition of plans too people, that is changing too lengthy plans to a combination of acquired skills and shorter checklists

Kleiboer (1997) clarifies how trainings can be used to develop new strategies (explorative training) or to test the effectiveness of known strategies (evaluative training). Learning in crisis management training exercises can be explained with theories like experiential learning (Kolb, 1984), group development and groupthink (Janis, 1972; Lewin, 1947; Tuckman, 1965), single- and double-loop learning (Argyris, 1977), and the learning organization (Senge, 1990). Crisis management training exercises are an example of applying gaming simulation for organizational development (de Caluwé et al., 2012).

A lack of consensus on the definition of crisis and the existence of a variety of theories that explain crisis management may leave training facilitators confused about what to teach in exercises (Hansén, 2009; Lalonde & Roux-Dufort, 2013; Scholtens, 2008; van Laere, 2013). Several authors (Boin & Lagadec, 2000; Borodzicz, 2004; Kim, 2014; Robert & Lajtha, 2002) conclude that crisis management training exercises too often focus on teaching "command & control" and "following the plans", whereas they poorly address the art of being flexible and adaptable under severe stress. As a result, crisis management organizations may be prepared to handle predictable emergencies, but may be poorly equipped to handle complex, chaotic, and ill-structured crisis situations where plans do not work.

Research on crisis management training almost exclusively discusses design, performance, and outcomes of exercises from a single-exercise perspective (Berlin & Carlström, 2015a; Carrel, 2005; 't Hart, 1997; Helsloot, 2005; Perry, 2004). A few exceptions (Borodzicz & van Haperen, 2003; Metallinou, 2017; van Laere, Lindblom, & Susi, 2007) show how learning outcomes in two or three subsequent exercises are related (i.e., how earlier failures are repaired or repeated). Several authors suggest that conducting multiple consecutive exercises is desirable, but do not elaborate on how to actually do that, for example: "*A suitably varied repertoire and timing of exercises may help organisations . . .*" ('t Hart, 1997: 213); "*It is necessary to engage in a continuous training program; . . .*" (Boin & Lagadec, 2000: 189); "*. . . responders should engage in smaller, more frequent, narrowly tailored exercises with limited goals before they get to exercises on the scale of TOPOFF.*" (Donahue & Tuohy, 2006: 18); "*. . . it is normally effective to develop the types of exercises progressively . . . simple types of exercises, such as discussion-based or table-top exercises, are employed as a rule prior to a large-scale live exercise.*" (Kim, 2014: 852).

Not any study could be identified that explicitly discusses how design of multiple consecutive exercises differs from design of single exercises, more than that identified deficiencies in one exercise become learning goals in the next (Borodzicz & van Haperen, 2003; Metallinou, 2017; van Laere et al., 2007). Consequently, besides the general lack of empirical accounts of the usefulness of crisis management training exercises, there is an even greater need for research on how series of multiple exercises can be designed, performed, and evaluated.

1.2 | The role of Swedish municipalities and their training needs

In 2006, Sweden changed the structure of the Swedish Crisis Management System and gave the local municipality a new and larger role in that system (Palm & Ramsell, 2007; Petridou & Sparf, 2017; Wimelius & Engberg, 2015). The major elements of the reform were a more integrated management structure (to stimulate collaboration between the numerous specialized institutions involved in a crisis) and bottom up emergency preparedness (involving actors with local knowledge who preferably perform their usual duties). The new emergency preparedness structure strongly rests on the idea that a crisis should be managed locally (principle of proximity), that each actor is responsible for the duties he or she performs in noncrisis situations (principle of responsibility), and that tasks and duties should be organized and located as in peacetime (principle of parity). The municipality has a so-called geographical area responsibility at the local level, which does not overrule or take away the existing sector responsibilities of other organizations, but is aimed at stimulating collaboration between all actors involved in a crisis. A similar integrating role with geographical area responsibility exists at the regional level (the county) and at the national level (the Swedish government). Wimelius and Engberg (2015: 131) note that "*the one feature that makes Sweden a very special case when it comes to the organisation of crisis management is the almost total absence of hierarchy and command structures*". No one in the Swedish system, not even the national government, can intervene in another actor's decision-making, which makes participation in crisis management efforts

more or less a voluntary matter (Wimelius & Engberg, 2015). Developing your role as a municipality in such a system may be quite complicated: The municipality has both its own sector responsibility (e.g., responsible for schools, elderly care, water supply) and the geographical area responsibility. The geographical area responsibility involves coordination before (risk analysis, training) and during crises (alarming relevant actors, coordinating their response efforts, communication with the public) while the partners involved may differ from crisis to crisis. As this role was completely new for Swedish municipalities, a huge training need has arisen from 2006 and onward, which was the starting point of our still ongoing research project.

2 | RESEARCH DESIGN

Our research approach follows an interpretative philosophy and an inductive research strategy as our aim is theory building rather than theory testing (Eisenhardt & Graebner, 2007). Action research (Argyris, Putnam, & McLain Smith, 1982) is applied to obtain the dual outcomes of action (change) and research (understanding). Empirical work has been conducted between 2006 and 2015 in 12 Swedish municipalities varying in size from 6,000 to 50,000 inhabitants.

"*As an interventionist method, action research allows the researcher to test a working hypothesis about a phenomenon of interest by implementing and assessing change in a real world setting*". (Lindgren, Henfridsson, & Schultze, 2004; 441). The phenomenon of interest is how to design crisis management training exercises in order to develop emergency preparedness. By analysing discrepancies between the hypothesized and actual changes in the real-world setting (developed emergency preparedness in the 12 involved municipalities), the action researcher gains both theoretical and practical knowledge about the phenomenon (how to design crisis management training exercises). As true action researchers, the involved researchers adopted different practitioner roles like exercise designers, training facilitators, role-playing observers, learning coaches, and so on. Five typical phases can be discerned in an action research cycle (Lindgren et al., 2004): a) diagnosing, b) action planning, c) action taking, d) evaluating, and e) specifying learning.

The planning, performance, and evaluation of each conducted exercise was an action research cycle (resulting in 140 action research cycles). The exercise team (2–3 researchers, an independent consultant and one to three representatives from the municipality to be trained) collaboratively performed the five phases. First, learning goals were derived from earlier training reports, from studying crisis management plans and from interviews with key persons in the municipality (diagnosing). Secondly, an exercise was designed in a number of meetings with the exercise team. Design involved determining learning goals, number and type of participants, length of the exercise, type of exercise (table-top or role-playing), crisis management practices in focus, pedagogical techniques, scenario design, and so on (action planning). Thirdly, the exercise was performed by the exercise team (action taking). Next, the process and outcomes of the exercise were evaluated by the exercise team and the exercise

participants. Evaluation revealed whether planned actions were performed as envisioned and whether observed learning outcomes matched planned learning goals. Besides observations from the exercise and the concluding debriefing discussion, evaluation included also tracking whether lessons learned were implemented in the trained organizations (evaluating). In the final phase, the exercise team reflected on a deeper level why planned actions resulted in expected and unexpected learning outcomes for the municipalities. In contrast to phase 4 which focuses on evaluating the intervention (what did the organization learn in this cycle), the fifth phase takes into account the cumulative experiences of the current and earlier interventions (what did the exercise team learn across all cycles thus far), confronts them with practitioner handbooks and academic literature, and formulates insights in how to design crisis management training exercises. This phase also generates questions and attention points for subsequent action research cycles (specifying learning). On a higher abstraction level, a series of crisis management training exercises in one municipality can also be seen as one action research cycle (resulting in twelve action research cycles on a higher level focusing on how to design a series of consecutive crisis management training exercises).

Table 1 shows how the exercises included in our research were distributed over the involved municipalities and over time (i.e. the 11 exercises in municipality 1 were conducted from 2006 to 2010, the 8 exercises in municupality 2 were conducted in 2007 and 2008, and so on). All municipalities participated for several years, although they entered and left the project at different times. Municipalities arranged additional exercises besides the ones organized by us.

From the 140 exercises, approximately 30% were table-top exercises, 50% were role-playing exercises, and the remaining 20% were theoretical seminars or specific skill training sessions. The number of trainees varied from 8 to 20 in table-top exercises and 15–50 in role-playing exercises. Interplay with external organizations was simulated by including external stakeholders in the exercise staff. External stakeholders were thus not trained. Series of exercises aimed at organizational development of the crisis management organization of each respective municipality. The crisis management organizations consisted of three levels or groups: politicians (the political level), the municipal manager and her/his team of municipal department heads (management level), and a support staff dealing with communication and information management (support level). The "who, what, and how" of exercises (whether politicians, management group or support staff or all three of them would be included; what crisis management practices were in focus; and whether a table-top or role-playing exercise was suitable) was not predetermined, but decided upon by the exercise team in the diagnosing and action planning phases of each action research cycle. Our work has continued in 2016 and beyond, but these exercises have not been part of the analysis presented in this article.

Data collection included field observations and working material from all action research phases. For example, an important new insight considering crisis management practices could be visible in our own reflective notes taken during a preparation meeting (diagnosing, action planning), in instructions for a table-top exercise (action taking),

TABLE 1 Number of crisis management training exercises per municipality over time

Municipality	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1	11 exercises									
2		8 exercises								
3			18 exercises							
4			22 exercises							
5			19 exercises							
6				8 exercises						
7				17 exercises						
8				6 exercises						
9							8 exercises			
10							7 exercises			
11							9 exercises			
12									7 exercises	

in our observation protocol for a role-playing exercise (action taking), in summaries of debriefing sessions, exercise evaluation reports or revised crisis management plans (evaluation), or in meeting notes where pros and cons of our training techniques across many crisis management training exercises were discussed (specifying learning). As such, triangulation occurred naturally (important issues showing up repeatedly at different places in our documentation).

Documentation has been analysed inductively, that is looking for interesting perspectives that emerged from reflecting on our work. Working inductively in action research does not imply to ignore earlier research evidence (e.g., research on how to design exercises), but rather to apply such best practice critically and with care, to be attentive for the unique needs of the training situation at hand, to be willing to "drop our tools" (Lalonde & Roux-Dufort, 2013: 24) and to explore alternative ways of designing and performing exercises. One perspective that emerged was the shift from single-exercise design (our initial perspective following common ground in crisis management literature) to designing multiple exercises in a coherent series aiming at evoking organizational development. As crisis management and gaming simulation literature gave few directions on how consecutive exercises could build upon each other, the involved researchers went back and forth in collected data from all five action research phases in completed and upcoming exercises to reveal how and why subsequent exercises in the same organization differed in design, performance, and outcomes. That analysis revealed how learning needs, training formats and techniques, training content, and generated learning outcomes were interrelated.

3 | RESULTS

Figure 1 portrays how unexperienced crisis management organizations have different learning needs compared to experienced ones, how training methods are adapted to accommodate for these differences, and how different crisis management practices are in focus in each of the three identified development phases. These phases are mirroring a development in our ten year research process and can at the same time be seen as a learning process ladder for an individual crisis management organization.

3.1 | Phase 1: Understanding crisis management basics

When designing the first exercises, municipality representatives from different organizational levels were interviewed to reveal their training needs. The most striking observation was the lack of role understanding. As the responsibility for crisis management was rather new, most municipalities were unprepared and hardly trained and educated. Employees were usually assigned to groups and got a list of duties (e.g., create a situation picture, organize press meetings, publish news on Internet), but they had often no clue what individual tasks involved, who should do what, or how their tasks related to each other. Not surprisingly, this lack of role understanding created low confidence in their individual and group performance.

Crisis awareness was also low. For example, there was a strong focus on a limited number of predictable scenarios (e.g., a snow storm in Sweden) and there were unrealistic expectations regarding resources from other agencies (e.g., "*the Swedish Armed Forces will come and help and take care of all our transport needs during a snow storm*").

Given poor role understanding, the aim of our exercises became to collaboratively explore good crisis management practices and to develop the crisis management organization (i.e., formative evaluation: learning for development). The aim was not to measure performance or judge who did something good or something wrong (i.e., not summative evaluation: not giving a grade). An exercise was an opportunity for group development, rather than a threat which
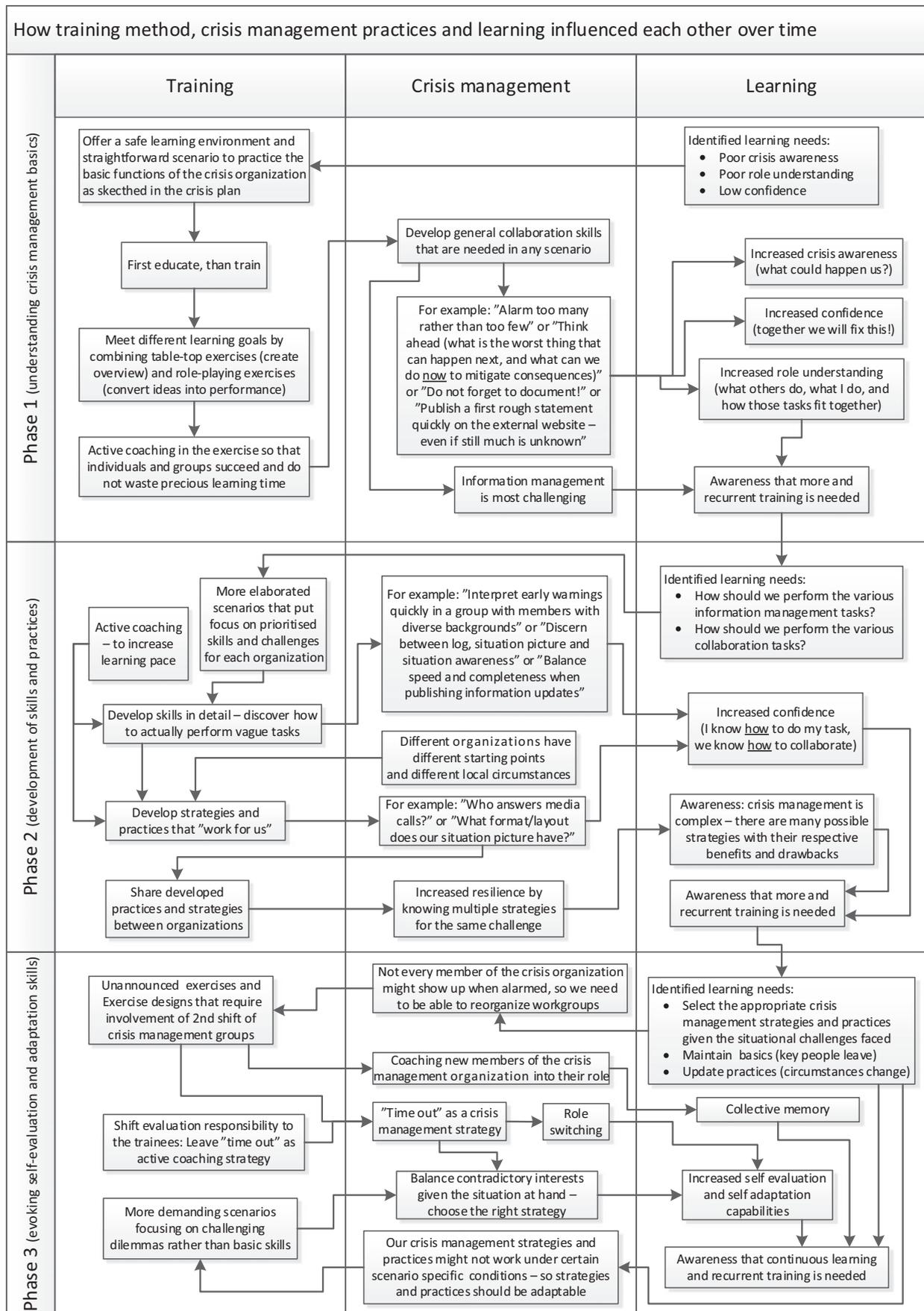
How training method, crisis management practices and learning influenced each other over time

Training	Crisis management	Learning

Phase 1 (understanding crisis management basics)

Offer a safe learning environment and straightforward scenario to practice the basic functions of the crisis organization as sketched in the crisis plan

First educate, than train

Meet different learning goals by combining table-top exercises (create overview) and role-playing exercises (convert ideas into performance)

Active coaching in the exercise so that individuals and groups succeed and do not waste precious learning time

Develop general collaboration skills that are needed in any scenario

For example: "Alarm too many rather than too few" or "Think ahead (what is the worst thing that can happen next, and what can we do now to mitigate consequences)" or "Do not forget to document!" or "Publish a first rough statement quickly on the external website – even if still much is unknown"

Information management is most challenging

Identified learning needs:
• Poor crisis awareness
• Poor role understanding
• Low confidence

Increased crisis awareness (what could happen us?)

Increased confidence (together we will fix this!)

Increased role understanding (what others do, what I do, and how those tasks fit together)

Awareness that more and recurrent training is needed

Phase 2 (development of skills and practices)

Active coaching – to increase learning pace

More elaborated scenarios that put focus on prioritised skills and challenges for each organization

Develop skills in detail – discover how to actually perform vague tasks

Develop strategies and practices that "work for us"

Share developed practices and strategies between organizations

For example: "Interpret early warnings quickly in a group with members with diverse backgrounds" or "Discern between log, situation picture and situation awareness" or "Balance speed and completeness when publishing information updates"

Different organizations have different starting points and different local circumstances

For example: "Who answers media calls?" or "What format/layout does our situation picture have?"

Increased resilience by knowing multiple strategies for the same challenge

Identified learning needs:
• How should we perform the various information management tasks?
• How should we perform the various collaboration tasks?

Increased confidence (I know how to do my task, we know how to collaborate)

Awareness: crisis management is complex – there are many possible strategies with their respective benefits and drawbacks

Awareness that more and recurrent training is needed

Phase 3 (evoking self-evaluation and adaptation skills)

Unannounced exercises and Exercise designs that require involvement of 2nd shift of crisis management groups

Shift evaluation responsibility to the trainees: Leave "time out" as active coaching strategy

More demanding scenarios focusing on challenging dilemmas rather than basic skills

Not every member of the crisis organization might show up when alarmed, so we need to be able to reorganize workgroups

Coaching new members of the crisis management organization into their role

"Time out" as a crisis management strategy

Role switching

Balance contradictory interests given the situation at hand – choose the right strategy

Our crisis management strategies and practices might not work under certain scenario specific conditions – so strategies and practices should be adaptable

Identified learning needs:
• Select the appropriate crisis management strategies and practices given the situational challenges faced
• Maintain basics (key people leave)
• Update practices (circumstances change)

Collective memory

Increased self evaluation and self adaptation capabilities

Awareness that continuous learning and recurrent training is needed

FIGURE 1 Interaction between training, crisis management, and learning over time

would reveal how poorly equipped they were. We repeated that message constantly in different ways: "*An exercise is not an examination; in this exercise the aim is to learn how we can become a better crisis management group*"; "*We will go around with notepads and write down a lot about you, but we will not give grades. We are there to help you remembering what you learn today. Please come forward to us if you want something to be remembered for the evaluation, then we will write it down and remember it for you.*"; "*The observers are a resource. If you get stuck or are lost in the exercise, ask us for help. We are here to help you succeed. We can show you alternatives how to continue if you do not identify them yourself*".

In early years, it happened occasionally that exercises were too difficult as trainees were not at all prepared for the duties they needed to perform. Consequently, we have learnt to diagnose the current level of emergency preparedness before a series of exercises. Next, our training process goes in small steps from theoretical education sessions via table-top discussions to role-playing, based on the philosophy: "first educate, then train". In this way trainees get a fair chance of building skills and confidence while expensive training methods like role-playing are not wasted on teaching basic issues. A table-top discussion, when everybody is in the same room, helps to show how different roles and tasks are related (i.e., when you do that, we do this next ...). Role-playing is a rich experience where tasks that have been expressed orally in a table-top discussion (e.g., "*we will alarm the crisis management group in 15 min*") now need to be put in practice under realistic conditions (where the same organization learned: "*it took 45 rather than 15 min to alarm and gather all involved employees*").

A final training technique we developed early on was "active coaching during playing". As trainees had many small and larger learning needs and were rather uncertain how to do all kinds of tasks, it soon felt as a waste of time to let them be confused for a long time and wait for the debriefing to conclude that they were stuck. Instead, we became active coaches rather than passive observers. When groups or individuals were puzzled, we intervened by asking questions. In that way we triggered a moment of reflection (a mini-debriefing) either where the trainees reasoned about action alternatives themselves, or where we suggested them an alternative strategy. Coaching boosted learning as participants could test promising practices for larger parts of the exercise. To stress the need to keep these moments of coaching scarce and short (to not distract trainees too much from playing), we called them "time-outs", referring to the short breaks allowed in some sports.

When discussing which scenarios to select as training content, it became more and more apparent that the choice of scenario actually is of minor importance. Rather, training design focused on accurately simulating basic crisis management processes that are relevant in any crisis scenario (e.g., interpreting early signals, alarming, environmental scanning, situation analysis, creating situation awareness, prioritizing resources and problems, delegating tasks, informing the public, etc.). These processes can be trained regularly and improved gradually across different scenarios. The scenario is only a vehicle to make the work processes concrete, practical, and realistic. The

optimal solution for the scenario is less interesting as the chance that *exactly* that crisis will occur is close to zero anyway. Instead, training goals and debriefing discussions aimed at "understanding how the crisis management organisation operates". A quote from a municipality representative during a training design session illustrates how they have adopted this training philosophy: "*It does not matter what scenario you pick when you design the exercise, anything could happen. The interesting issue is how we work together, that is what we are curious about*".

One crisis management practice which many municipalities struggled with was "alarm too many rather than too few". Involved municipalities had a tendency to alarm too few people when the situation is ambiguous in the early stages. A common argument was "*we alarmed only the group members that represent parts of the organisation that are directly involved in the incident, not everybody*". This hampers both a fast response (the few involved individuals get overwhelmed by the numerous issues to address) and hinders an in depth analysis of the problem (not so obvious consequences for other parts of the organization are overlooked as the alarmed group members only represent a narrow definition of the crisis).

Another example of a challenging crisis management practice was "thinking ahead". As a crisis by definition involves a lot of ambiguity, decision-makers tended to get stuck in "understanding what actually happened" and look backward rather than forward. The consultant endlessly repeated his mantra that "*Crisis managers need to look ahead and catch the future, they should ask themselves: What is the worst that can happen us next and how can we mitigate that?*".

Series of exercises increased role understanding, crisis awareness, and confidence. In early exercises, trainees were passive, confused, and had hard to answer how they would take action. Later on, they could put crisis management activities in a logical order (in small group discussions) and argue for their chosen structure, they came with own suggestions how to improve individual tasks or how to manage the relation between different groups/tasks (during role-playing or in concluding debriefings) and they asked more complicated questions to us. Crisis awareness increased ("*anything can happen, not only a snow storm*") and trainees learned after participating in multiple exercises how the same activities reoccurred irrespective of the type of crisis scenario. Although the pace, amount, and type of progress differed between municipalities, distinct improvements were visible in each of them.

Not seldom, debriefings concluded with "*we need more training*" as one of the lessons learnt. When certain crisis management skills were mastered, new challenges became visible and initiated a logical continuation of the longitudinal learning process.

3.2 | Phase 2: Development of skills and practices

After having learnt crisis management basics, trainees posed more and more detailed questions about how to perform individual and collaboration tasks. Decision-makers were quite confident in making decisions based on a situation picture, even though it should be done faster and under greater uncertainty. Information management

duties like collecting information, validating information, and structuring information to arrive at such a situation picture were experienced as much more challenging. Decision-makers had to avoid getting occupied with these operational information management tasks by delegating them to a support staff. The support staff consisted however of people that normally did not work together and did not perform "information management in crisis" duties. Participants could be anyone from librarians, secretaries, analysts, or other administrative staff. Support staff members had to develop all kind of individual crisis management skills. For instance, they had to perform tasks like "scan the newspapers and social media" or "check the trustworthiness of information collected", while not really having a clue how to do this, or in what format and how often the results should be reported. In addition, they faced internal group dynamics and group development issues, as they never had worked together. Finally, developing the relation between support staff and decision-makers required several exercises until communication and collaboration routines were set.

Training techniques from the first phase were reused. A safe learning environment, where mistakes were seen as learning opportunities, stimulated participants to explore many information management strategies. Such strategies were first discussed orally in table-top discussions and next reality-tested in role-playing exercises. Active coaching was applied to fine-tune strategies during playing.

Although many strategies needed to be explored, an important insight was to limit the amount of learning goals per exercise. Aiming at too many different issues per exercise makes learning superficial. The scenario was adapted to be more detailed with respect to the work processes in focus in the particular exercise, whereas processes outside of scope were simulated more superficially.

The 12 municipalities differ dramatically in size, in the kind of persons on key positions, in type of organizational culture, in type of potential emergencies and crises that might occur and in initial crisis preparedness when they started training. Due to these differences, and due to our democratic participative training methods which promoted them to take initiative, municipalities soon developed many alternative strategies for common challenges. An unexpected richness of "good crisis management" practices arose. Although we actively shared best practices between the organizations, it quickly showed that a "one size fits all" approach was unsatisfactory. Instead, "creating practices that work for us under our circumstances" was positive for local adoption and the continuous adaptation and fine-tuning of work strategies led to second order learning on a deeper level (Argyris, 1977).

When trainees got engaged in developing their work practices, they started to realize how complex crisis management actually is. Throughout the years, trained municipalities and we as facilitators have learned how a crisis management group faces complex challenges and dilemmas that cannot be managed with straightforward recipes. For instance, information needs to be processed fast, but needs at the same time be validated extensively. This requires paradoxical arrangements where support staff at one hand presents potentially important but not yet completely validated information

quickly, and at the same time puts energy in further validating and complementing the same information.

Improvements in personal or collaborative skilfulness go hand in hand with an increase in confidence for the capability of the individual or the group to meet a crisis. Before having trained work processes and collaboration routines in detail, it is not uncommon that people are insecure and stressed. Although a lot might have gone wrong during exercises, it is frequently stressed before and after exercises that it is good that these weaknesses have been identified so that measures can be taken to repair these deficiencies. It is explained that crisis management implies insecurity and that doubts need to be shared and failures need to be identified and repaired, even during a real crisis response. Such insights contribute to increased confidence of participants, who realize that it is not just their fault that things do not go perfect, but that failures are partly due to the inherent complexity of crisis management.

Recurrent training clearly improved crisis preparedness of individuals, groups, and organizations. At the same time, repeated training is no guarantee for crisis preparedness on all aspects, and learning pace can differ from organization to organization. Municipalities differed in what skills and collaboration practices they mastered easily and which they struggled with in several consecutive exercises. Not surprisingly, the need to train more often was therefore uttered frequently in the concluding debriefings of exercises.

3.3 | Phase 3: Evoking self-evaluation and adaptation skills

In phase two, municipalities evolved from paper plans and checklists to reality-tested and elaborately refined collaborative work practices. However, trainees realized that in a real crisis, only parts of the crisis management group may show up. That means that developed collaboration routines are provisional and fallible and need to be "re-developed or adapted" at the start of any crisis incident. A third learning phase emerged where municipalities learned to evaluate their current crisis management performance independently and to reorganize and adapt their work practices on-the-fly during an ongoing crisis response.

Again, proven training methods were reapplied and fine-tuned to meet the new learning needs. Unannounced exercises challenged well-trained crisis management groups to redistribute tasks or call in substitutes when not all their members could participate. Another variant was to simulate a scenario with a long-lasting crisis where a second shift would replace the first one. In all these training situations, the challenge was to keep well-functioning practice running when part of the roles were taken by new individuals.

The power of self-evaluation has gradually become more and more apparent in our ten year research process. In all learning phases, debriefings always starts with trainees sitting in small groups to "*list three things you did well and three things you would like to do different next time*". This opens for more creative input from trainees themselves. Subsequently, each subgroup presents their lessons learnt for the others. More experienced municipalities demonstrate

their acquired evaluation skills clearly as facilitators often can conclude with: "*We just want to emphasise one issue already mentioned, we do not have any important observation to add that you not already mentioned yourselves*". In not so experienced municipalities, the contributions of trainees are shorter and we as facilitators elaborate in more detail on strengths and weaknesses of their performance and how deficiencies can be repaired.

Self-evaluation skills are also developed during active coaching, where trainees first are listeners, but slowly become more active in arguing about pros and cons of work practices and finally start to copy the role of the active coach by initiating "time-outs" themselves. Exercises were never stopped to enable time-outs (as the crisis does not pause in reality either). Municipalities learned how to perform short and focused time-outs under a running exercise, asking themselves "*Are we doing the right things, are we doing those things in the right way, and what should we change and why?*". Note that these time-outs focus on "how to carry out crisis management work practices in general", not on the scenario/situation at hand which instead is addressed in situation awareness status meetings. Trainees and facilitators concluded in concert that regular time-outs are not just an exercise technique, but also a viable crisis management practice to be applied during a real crisis response.

Although crisis management procedures are partly captured in crisis plans and checklists, individuals and their collective memory are the main carriers of emergency preparedness. A longer period without training or real incidents, or when key-people leave the organization and are replaced by new members, may result in deteriorating preparedness, (partly) forgotten crisis management practices and a need to relearn issues which they no longer master.

Collective organizational memory was nicely observed in an exercise where many new members joined the support staff. The municipality chose (at their own initiative, while we as facilitators were unaware of their move) to let the new members perform most of the tasks, so they could experience the difficulties. More experienced group members sat on a chair next to them and coached them in how to do tasks effectively and how to manage conflicting interests. When the new members suggested changes to one of the dominant routines, the more established group members argued against that change: "*No, we have tested that before, and although it sounds good in theory, it does not work in practice, it solves one thing, but creates a number of other problems*". Regularly recurrent training helps to share earlier developed experience in a rich way with new members and keeps collective memory fresh and alive. Likewise, municipalities that waited a long time between two exercises (for example more than 2 years) suffered from degraded performance or had a tough time in fulfilling their duties. Crisis management capability is perishable and needs to be maintained!

3.4 | Interaction between training, crisis management, and learning over time

The key characteristics of training, crisis management, and learning shown in Table 2 have been developed in strong interaction,

TABLE 2 Key elements of training, crisis management, and learning

Characteristics of the training approach
A crisis management training is an environment to develop and learn, not an examination
First educate, than train
Focus on "how the crisis management organisation operates," not on solving the scenario
Active coaching during game execution speeds up the learning cycle
Encourage self-evaluation
Recurrent training is needed to master different skills and to refresh collective memory
Characteristics of the crisis management approach
Alarm too many rather than too few
Information management is a crucial prerequisite for decision-making
Think ahead: What is the worst thing that can happen next?
Develop strategies and practices that work for us under our circumstances
Balance contradictory interests like speed versus quality/detail, perform "good enough"
Take regular time-outs for critical self-evaluation
Types of learning
Understand your own role and how it relates to others
Increased crisis awareness
Increased crisis preparedness (acquired individual skills and collaboration skills)
Increased individual and organizational confidence
Awareness that crisis management is complex
Collective organizational memory
Self-evaluation skills
Awareness that recurrent training and learning is needed

strengthen each other in a coherent package, and evolve together from early to later phases.

Whereas the same exercise formats (alternating table-top and role-playing) and the same scenarios are used, the focus in training and debriefing shifts between phases 1 and 2 from defining roles (*what* do I do?) to performing roles (*how* do we do it together?). For example, considering "informing the public via the website", training in phase 1 focuses on figuring out who is involved in that process, and who has mandate to define a message or publishing it. Training pace is low, and the content or quality of the produced message is of less interest. In phase 2, the same scenario can become a much tougher exercise by changing the pace of the exercise and simultaneously requiring a smooth collaboration process and a well-formulated message. In phase 3, in a similar way, the same scenario can reused, but adaptation of roles or work practices can be enforced by changing external constraints (e.g., a required role is occupied in a meeting; resources like Internet/phone are temporarily not available; or the message topic is extremely complex and consultation of

multiple external subject matter experts is required). Throughout this whole training process, as trainees gain more confidence from phase 1–3, the role of the facilitators changes from initially being active coaches strongly guiding the learning process, to more and more being passive observers of trainees who become more confident and self-reflecting.

Training, crisis management, and learning did also influence each other across phases. For example, poor role understanding amongst trainees made traditional debriefing too time consuming and urged us to develop a new training technique in the first development phase: active coaching. Later, in the third development phase, time-outs evolved from a facilitator-initiated coaching technique during exercises into a collaborative trainee-initiated self-evaluation practice for assessing and improving crisis management performance on-the-fly under an ongoing crisis response. So a specific learning need (poor role understanding) inspired us to develop a new training technique (active coaching during role-playing) which later became a crisis management practice (regular time-outs).

Similarly, during exercise design and debriefing, we as facilitators did not have ready-made or final answers. Questions like "What is good crisis management?" could be answered by anybody and viable crisis management strategies and practices were developed in dialogue. Due to this open-mind attitude, information management was discovered as an initially unknown learning need in the first development phase. In phase 2, the same open-mind attitude caused the creation of a large variety of alternative information management practices. This richness of alternative practices generated a new learning need in phase 3: the ability to reflect on your own work performance and judge which of the available strategies would be most appropriate in the current crisis situation. So a specific training technique (democratic dialogue in design and debriefing) revealed a new learning need (the challenge of information management) which created a rich fauna of new practices (many alternative ways of managing information in crisis) which required that crisis management professionals developed another capability (self-evaluation and adaptation of work practices on-the-fly).

4 | DISCUSSION

Most research discussing exercise design (Borodzicz & van Haperen, 2002; 't Hart, 1997) or usefulness (Berlin & Carlström, 2015a,b; Carrel, 2005; Helsloot, 2005; Perry, 2004) has a single-exercise perspective. A few exceptions have shown that learning in subsequent exercises is related (Borodzicz & van Haperen, 2003; Metallinou, 2017; van Laere et al., 2007) or have suggested that conducting multiple exercises in a series may be desirable (Boin & Lagadec, 2000; Donahue & Tuohy, 2006; 't Hart, 1997; Kim, 2014). None of them provide much detail on how the design of multiple exercise in a series differs from single-exercise design. Our research differs therefore substantially from previous research on a number of aspects, namely:

- Our observations are based on sequences of 6–22 consecutive exercises in a single organization, rather than two to three successive exercises as in Borodzicz and van Haperen (2002) or Metallinou (2017).

- Sequences of consecutive exercises have been designed and evaluated in twelve municipal organizations in parallel, enabling us to reflect whether similar consecutive-exercise designs give corresponding outcomes in different organizations. Whereas Berlin and Carlström (2015b) replicated their experimental exercise design in seven occasions, their single-exercise perspective and individual learning focus is not comparable to our sequences of consecutive exercises aiming at collaborative practices and long-term organizational development.

- Our deep engagement as action researchers has given us a rich understanding of the challenges, strategies, methods, and techniques of designing crisis management training exercises and how this influences exercise usefulness, rather than being passive observers of executed exercises (Berlin & Carlström, 2014, 2015a; Kim, 2014) or postfactum external evaluators of exercise documentation (Carrel, 2005; Helsloot, 2005; Metallinou, 2017). Berlin and Carlström (2015b) influenced exercise design as part of a quasi-experimental study and evaluated the impact on learning, but from an individual learning and single-exercise perspective. Borodzicz and van Haperen (2003) combined the roles of exercise directors and researchers, but their study is limited to two successive exercises in one organization.

As our research is explorative, our results generate propositions (based on considerable evidence from 140 action research cycles) which need to be further developed and evaluated to assess to what extent they are repeatable and applicable in other contexts (see Table 3).

These propositions enrich earlier understanding of training in consecutive exercises. Our findings confirm the suggestion that a continuous training programme (Boin & Lagadec, 2000) and a varied repertoire and timing of exercises ('t Hart, 1997) not only is beneficial for more profound learning (proposition 1) but also necessary to maintain earlier acquired competences (proposition 5). Exercise formats could preferably be alternated (proposition 1b) rather than only be applied progressively (Donahue & Tuohy, 2006; Kim, 2014). First, discussing work practices in a table-top exercise leads indeed to more effective training of those practices in a subsequent role-playing exercise, in line with Donahue and Tuohy (2006) and Kim (2014). In addition, conducting a table-top exercise *after* a role-playing exercise leads to a much richer discussion in that table-top exercise, as participants elaborate on experiences from the earlier role-playing exercise.

Learning involves more than just repairing failures from earlier excises (Borodzicz & van Haperen, 2003; Metallinou, 2017; van Laere et al., 2007). Regular exercising in varied forms evokes a continuous purposeful learning process where competencies and skills in earlier phases provide stable ground for mastering more complex capabilities later on (propositions 2 and 3). Learning the "art of

TABLE 3 Propositions for training in consecutive exercises

Propositions for organizational development of a crisis management organization through training in series of consecutive exercises
1. Richer and richer learning outcomes for trainees and facilitators can be generated by
a. Regularly exercising in consecutive exercises
b. Alternating exercise formats (e.g., table-top and role-playing)
c. Alternating training with a single, a few or multiple group(s)
2. Regular exercising generates different types of learning outcomes over time:
a. Understanding roles and responsibilities (phase 1)
b. Developing collaborative skills and practices (phase 2)
c. Mastering self-evaluation and on-the-fly adaptation of roles, responsibilities, and practices (phase 3)
3. Learning outcomes in different phases build upon each other in a logical order, that is
a. Developing collaborative skills (phase 2) builds upon acquired understanding of roles and responsibilities (phase 1)
b. Self-evaluation (phase 3) builds upon developed collaborative skills and acquired understanding of roles and responsibilities (phases 2 and 1)
4. Identified learning needs (or desired learning outcomes) for a particular phase or exercise determine what training content is relevant and what training methods (formats and techniques) are appropriate, guiding for instance the:
a. Pace of the exercise
b. Level of detail in the scenario
c. Degree of uncertainty/dynamics in the scenario
d. Number of individuals and groups trained
e. Ambition level of the desired performance and learning outcomes
5. Acquired crisis management capability is perishable, that is
a. Long periods of nontraining may decrease crisis management capability
b. Substitution of key persons may decrease crisis management capability
6. Self-evaluation skills can be developed gradually in different ways, for example when
a. Facilitators ask trainees reflective questions during active coaching
b. Trainees reflect on strengths and weakness of their collective performance in facilitator-led debriefings
c. Trainees autonomously evaluate and adapt their ongoing performance on-the-fly in time-outs
7. Moments of success and failure need to be balanced, to maintain a continuous desire for more learning and training, that is
a. Too much failure may result in beliefs of incompetence (trainees give up)
b. Too much success may result in illusions of invulnerability (trainees see no need to train anymore)

adapting" (Robert & Lajtha, 2002) might not require a totally different training form which replaces traditional training (Boin & Lagadec, 2000; Robert & Lajtha, 2002), but might instead be a higher competence level (phase 3) building upon earlier phases. In other words, reorganizing responses and adapting practices on-the-fly requires that standard responses and practices are well understood and mastered in the first place (proposition 3). Lalonde and Roux-Dufort (2013) suggest writing learning journals (Hedberg, 2009; Schön, 1987) as a technique to teach crisis managers individual reflection skills. Our teaching techniques (active coaching by facilitators, open democratic reflection in debriefings, and the time-outs) are complementary as they develop collaborative reflection processes in groups, rather than individual skills.

The gradual development from phase 1 to 3 requires more subtle exercise design than just going from table-top to role-playing or switching to more complex scenarios. Learning challenges can also be created by changing the pace of the exercise, the number of participants, the degree of uncertainty/dynamism or by increasing the performance requirements (proposition 4). While slowly raising the bar in consecutive exercises, it is important for facilitators to carefully monitor the balance between failure and success to keep trainees motivated and eager to learn (proposition 7).

Several limitations of our research need to be highlighted. The focus of this article is to illustrate the interplay between exercise design, exercise content, and learning outcomes. Consequently, a small selection of elements from these respective dimensions (design, content, outcomes) have been discussed, where the relations between them were especially apparent. For reasons of clarity and due to space limitations, it is not possible to discuss training design, training content, and learning outcomes in detail.

Our inductive qualitative action research study aims at theory building. The access to twelve organizations with their unique prerequisites has increased the diversity of learning needs and outcomes observed and has made our exercise designs and content more diverse. There has not been any ambition to test appropriateness of exercise designs under different conditions or to perform comparative studies between municipalities.

Our research has been conducted in 12 Swedish municipalities that had low affinity with crisis management. Whether the results are transferable to other countries and other kind of organizations needs to be explored in future research. The training approach might be especially attractive for organizations with limited crisis management capability. Organizations that particularly have trained level 1 and level 2 learning goals might use our approach to evolve to level 3. An interesting future research avenue is studying design of consecutive exercises in different contexts like public safety organizations (police, rescue services, ambulance) or multiorganizational settings.

5 | CONCLUSION

The analysis of over one hundred crisis management training exercises in twelve Swedish municipalities during a period of ten years shows how learning needs, training methods, training content, and generated learning outcomes are tightly interdependent. By varying

training formats and techniques over time in a coherent series of recurrent exercises, different aspects of crisis management capability can be developed while creating a variety of learning impacts on the individual, group, and organizational level. General crisis management practices are to a large part provisional and debatable and need to be continuously adapted to local organizational circumstances and characteristics of the crisis at hand. Consequently, crisis management organizations should ultimately learn to independently evaluate and reorganise their own crisis management performance on-the-fly. Such collaborative reflection skills can be developed when training evolves from facilitator-initiated active coaching to trainee-initiated time-outs, and when such reflection in time-outs turns from a training method into a crisis management capability.

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