

Who Learns from Crisis Management Exercises: An Explorative Study

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ABSTRACT

Exercises are stated to be an important means to learn how to handle crises. However, it has been discussed who should participate and what can be learnt from them. Several roles are involved in the planning, execution and evaluation of exercises, such as participants, observers, facilitators and evaluators. This paper presents an empirical study of the differences in learning experiences between participants and observers. The study was based on interviews with participants and observers involved in a series of exercises at municipality level. The result shows that the participants' learning relates to individual experiences and how well they felt they performed the task. Meanwhile, the observers' learning experiences concerned organisational issues. The findings suggest that to achieve variation in learning experiences, which is important for inventing new solutions, crisis management organisations need to allow their personnel to try different roles in the exercises to increase the learning outcome.

Keywords

Learning, exercise, crisis management

INTRODUCTION

Crises are events where substantial values are at stake and resources have to be prioritised, commonly with limited situational awareness (Boin, 2009; Borodzicz and Van Haperen, 2002; Sundelius et al., 1997). To be able to manage crises, response systems need to possess a variety of capabilities. In multi-agency contexts, essential capabilities include interaction, relationships, coordination/C2, system performance, preparedness, situation awareness, resilience, decision-making and information infrastructure (Granåsen et al., 2018).

Exercises is a means for societies to develop, maintain and ensure their crisis management capabilities (Borell and Eriksson, 2013). These are typically carried out as multi-agency, inter-organisational exercises, in which several different roles take part in the planning, execution and evaluation. Examples of such roles are participants who will do the training, observers, facilitators and evaluators (Borodzicz and Van Haperen, 2002). During the exercise, the participants carry out the tasks they would perform during an actual crisis, whereas the observers study how the tasks are carried out and how the exercise is executed. Depending on the purpose with the exercise, the participants and the observers learn different things.

Borodzicz and Van Haperen (2002) have argued that facilitators and observers learn from crisis exercises, albeit other things than the actual participants. Participants gain experience and knowledge about their functions, while observers and facilitators gain an insight into how the process works, which is useful to the evaluation and organisational development. In healthcare, Reime et al. (2016) performed a simulation exercise with student nurses, where some of the teams were participants and others were observers. In the study, six learning criteria were defined. The result showed that three of the criteria represented a higher level of learning for participants, whereas in three there was no difference. The observers in the study felt that to gain more confidence in a situation, more hands-on experience was required. Still, one conclusion was that it is important to learn from different roles. Furthermore, in a similar study, Lai et al. (2016) stated that learning effects among participants are not superior

to those among observers, even if their study showed that participation improves the ability to perform the task assigned more, compared to merely observing it. Hence, it has been claimed that observation could be beneficial for gaining more effect from resource-intensive exercises. Studies that relate to this issue have been performed, but there is a lack of empirical studies within the context of inter-organisational crisis management exercises focusing on learning capabilities rather than individual skills.

The objective of this paper is to explore whether there are qualitative differences in learning between participants and observers in crisis management exercises. Furthermore, the objective is to explore what the differences consist of and how they relate to learning, reflective capacity and creativity. The study was performed during a series of crisis management exercises involving the municipalities in the county of Östergötland, Sweden.

BACKGROUND

The process of learning through exercises is important in order to develop crisis management capability. This section presents theories of learning and different types of exercises.

Exercises

Crisis management exercises are proactive events, which are held to strengthen the participants' crisis management capability (Grunnan and Fridheim, 2017). Hence, participation in exercises is a means to strengthen skills and capabilities to handle a crisis.

Different types of exercises have been suggested to increase capability in crisis management. These could be discussion-based (e.g. seminars and workshops), or operation-based (e.g. drills and functional exercises) (Grunnan and Fridheim, 2017). According to Peterson and Perry (1999), tabletop, functional, and full-scale exercises are common types. Collaboration exercises consist of both drills and strategic exercise elements (Berlin and Carlström, 2015). The aim of these exercises is to bring actors together, in order to jointly solve situations by complementing each other's abilities.

Tabletop exercises are discussion-based exercises where the participants examine a given situation (Steward and Wan, 2007). In this form of exercise acting is not required. Instead, the participants discuss how they intend to act (Van Laere and Lindblom, 2018). *Simulation exercises* is a form of tabletop exercise, in which the participants act out their functions in real time according to a scenario. A simulation should reflect reality as closely as possible, so that the participants can experience elements such as time pressure, uncertainty and inadequate information (Borodzicz and Van Haperen, 2002). *Functional exercises* are more complex than tabletop exercises and focus on one or a few functions (Perry, 2004). Focus is commonly on management level and on the coordination between actors and organisation. *Full-scale exercises* are aimed at testing all crisis management functions, including those that represent the "boots on the ground" (Perry, 2004).

Learning

Learning is the process of acquiring knowledge, behaviours, skills, values and preferences, which can be seen as continually ongoing. Learning can be intentional or unintentional, and it can have a wanted or unwanted effect. The theory about learning is extensive, where different ideas and directions are promoted in different research fields, such as educational psychology, neuropsychology, experimental psychology, and pedagogy. In this section, some of the learning theories that are applicable for understanding learning in and from multi-agency, inter-organisational exercises are presented.

Organisational learning is regarded as individual experiences encoded into rules, roles and routines that guide the behaviour of the organisation (Levitt and March, 1988). In this way, knowledge and experiences are maintained in the organisation, even if individuals are replaced over time. Argyris (1977) described organisational learning as single and double loop learning. *Single loop learning* occurs when organisations upgrade their procedures, e.g. due to problems discovered during an exercise. *Double loop learning* occurs when organisations perform more fundamental changes, e.g. changing rules of engagement, business goals or policies.

Experiential learning is the process of learning through experience (Kolb, 1984). It is based on principles originating from ancient times, such as those of Aristotle. Later, Kolb (1984) developed a modern theory of experiential learning based on the work by John Dewey, Kurt Lewin and Jean Piaget. One idea of the theory is to make the participants more involved in their learning. Lewis and Williams (1994) stated that a simple form of experiential learning is *learning by doing*. Participants learn through their own perceived experience followed by reflection. This may result in new skills, new abilities or new ways of thinking. Experiential learning can be carried out as field-based experiences and classroom-based learning. It is held as a powerful and proven approach

for learning, based on the idea that people learn easier through experience. Experiential learning in the form of an exercise is claimed to be an effective tool for learning multiple competencies context (Silenas et al., 2008).

Situational learning takes place in the same context in which knowledge, skills and abilities are applied (Lave and Wenger, 1991). The learning process is ongoing and occurs among individuals engaged in social activities. The learning process is natural and knowledge cannot be separated from the situation.

According to Borodzicz and Van Haperen (2002) and Reime et al. (2016), hands-on experience is important for learning, but the learning outcomes in different roles of participation, for example, observing and teaching, vary. As one crisis is different from another, learning crisis management requires variation. Variation theory in learning implies that an individual could transfer learnings from one situation to another. Through variation in exercise scenarios, it is possible to learn generic skills that could be used no matter what kind of crisis needs to be handled. For example, types of crises are changing (e.g. forest fires and earthquakes), but crisis management systems need to be able to share information, coordinate actions, etc. (Borell and Eriksson, 2013).

Reflective process

Reflection is an important stage in the learning cycle for experiential learning and the ability to learn from exercises (Stainton et al., 2010). When participants have an opportunity to reflect on what happened during or after the exercise, experience transforms to learning. Furthermore, a participant or a team failing to solve a task provides a good opportunity for reflective learning. In these cases, a deeper learning and understanding could be achieved if the reflections focus on how the failure occurred (Stretch, 2000). The reflective process needs to be a critical examination of actions taken. It is easy to say what springs to mind, but the participants must question that thought or the actions that were taken during the crisis or exercise (Lalonde and Roux-Duford, 2013).

Reflection through debriefing is common in crisis management exercises. The participants often perform this after the exercise. The debriefing process could be guided, video-based, or performed through questionnaires or panel discussions. It has been argued that a structured debriefing process with a significant discussion on what happened is effective for transforming experiences into learning (Borodzicz and Van Haperen, 2002; Kim, 2014).

Creativity

In crisis management, creative thinking is needed in order to apply routines in a different way (Borodzicz and Van Haperen, 2002). Further, creativity that drives innovations is vital for improving practices and organisation changes to better meet a changing environment and conditions (Amabile et al., 1996). Woodman et al., (1993) defined organisational creativity as “the creation of a valuable useful new product, service, idea, procedure, or process by individuals working together in a complex social system”. According to Amabile (1998), creativity is based on the three components expertise, creative-thinking skills, and motivation. *Expertise* refers to what individuals know about the issue of interest, whereas *creative-thinking* requires releasing the potential of the mind to come up with new ideas. Creative thinking is based on individuals’ attitude toward problems and solutions, together with their skills to amalgamate existing solutions into new combinations to provide new functionalities or capabilities.

METHOD

The present study was based on interviews with participants and observers in a series of crisis management exercises that took place in municipalities in the county of Östergötland, Sweden. Each crisis management exercise lasted for one day and included blocks of different scenarios that were performed as simulation exercises (Borodzicz and Van Haperen, 2002). The scenarios were separate and there was a restart for every scenario. Each scenario lasted for 60-90 minutes. The scenarios included a bus accident involving local students, a car hitting a crowd demonstrating in the centre of the municipality, and flooding in large parts of the municipality, leading to power failure. The exercise included a short period of time for reflections after the scenarios, albeit not in a structured manner. The aim of the exercise was to enhance the municipality’s ability to work with crisis management in their organisation according to its assigned routines.

The respondents took part in the crisis management exercise, either as participants doing the training or as observers. For the participants, the exercise was performed in their own organisation. Their training involved functions in the crisis management staff. The observers came from another municipality than the one where the exercise was performed and their partaking was voluntary. They provided an observation protocol for support, the use of which was optional. As the exercise mainly took part in the same room, the observers could observe most parts.

The interviews were conducted by telephone and lasted for 15-30 minutes. As no individual learning goals had been provided for the exercises, the respondents were asked to make a self-assessment of their learning experience. Twelve interviews were performed with participants from six exercises, one to four respondents from each exercise. Of these, four were participants in the training and eight were observers. The interviews were performed in Swedish. Therefore, citations used in this study have been translated into English by the authors. The questions were divided into three sections (Table 1). The interviews started with questions about the participants' experiences, which were described in two ways. First, according to their present functions, if they had other functions in crisis management and how long they had been working with crisis management. Second, in what ways they had taken part in the crisis management exercises, that is, as participants, observers or another role. The second section included questions to the participants who done the training. The questions in this section were about the participants' expectations before the exercise and what they learnt from the exercise. The third section included questions to the observers. The semi-structured questions in this section were about what they had learnt from observing the exercise and if they would have acted differently from the participants. The interview responses were noted during the interview.

Table 1. Interview questions. The questions were asked in Swedish and translated into English by the authors.

Initial questions	Questions to the participants	Questions to the observers
Role in the exercise?	What were your expectations on the exercise and did you practice the things you expected?	What were your expectations as an observer during the exercise?
What is your present function in the municipality?	What did you learn from the exercise?	What did you learn from the exercise? Is there anything you did not learn?
Present experiences in the field of crisis management	What learnings do you bring to future work?	What did you learn that you can bring to your own organisation?
What is your experience of exercises? Participant doing the training, observer, evaluator, facilitator?	How do you expect that the results of the exercise will be used?	Would you have acted differently from those performing the exercise? Did you have more time for reflection as an observer than you would have as a participant?

The analysis started with the construction of interview questions to investigate the areas; (1) reflective capacity, (2) dimensions of learning (e.g. individually, team, organisation), (3) earlier experience from crisis management and (4) creativity to find new solutions. The questions were inspired by Borodzicz and Van Haperen (2002).

The analysis of the collected interview responses was performed by two of the paper's authors. Further, the analysis was carried out iteratively, where categories of similar responses were used to form themes. As more data was analyzed the themes were further refined and clarified, resulting in the final set of themes *described lessons*, *reflective capacity*, and *creativity*.

RESULT

The two respondent groups for this study were participants and observers. The participants were trained for their functions in the exercise as chief of staff. In their daily work, they held a position in the administration of the municipality, partly related to crisis management. Two of the observers had been recently employed at the municipality and observed the exercise to gain experience of how crisis management is carried out within municipalities. They had experience of crisis management and response through other organisations such as rescue services and insurance. All of the observers worked with crisis management development and strategies in their own organisations.

Experience from exercises varied, but overall, the respondents had taken part in an exercise more frequently as a participant doing the training rather than as an observer, facilitator or planner of an exercise. In general, those with more experience had both planned and trained in emergency exercises with less need for inter-organisational

collaboration to solve the assigned tasks. Six of the respondents mentioned that they had taken part as a planner or evaluator for their organisation in the most recent collaboration exercise held in Östergötland.

The results are presented according to the participants' and the observers' learning. Finally, the differences in learning between these roles are presented. Learning is described in the areas learning dimensions, reflective capacity, and creativity. Citations from the interviews are used to illustrate the responses.

Participants' learning

The participants in the exercise described their learning based on individual experience, for example, how they practised their own function and how they reacted to the pressure of performing crisis management tasks. One of the participants expressed the importance of feeling secure with the methods that are to be used: *"if you learn them and feel secure with them, you will not feel the same pressure and you can focus even in a stressful situation"*. Another participant wanted to test their learning from earlier education regarding how to act as chief of staff.

The participants had to solve problems during the exercise, which made it difficult to reflect at the same time since the start-up phase was intense. This meant that the participants saved their reflections until they knew the outcome of the scenario and the results of their acting. One observer expressed it as *"valuable to reflect when it is going on [the exercise]. As an active participant you do it afterwards if there is an opportunity, but in these cases it is not as easy"*. However, there were reflections that did not depend on the outcome of the crisis. One of the participants noted the importance of redundancy and replacement of personnel due to exhaustion and tiredness.

Creativity was described as the ability to apply existing procedures in new ways, which might lead to changes in how they are carried out. One example of creativity was described by a participant as *"We have cards that describe our functions in our organisation. I wanted to use them but realised that I chose to do differently to adjust to the situation we had"*.

Observers' learning

The observers described what they learnt from an overview perspective, for example, how to develop methods and train people in their own organisations. One observer described the learning as *"Their staff included decision-makers, which ours does not since it is a separate group. It is another way of working, which we could consider. It would be quicker to make decisions, but at the same time it might disturb the operational work"*. The overview perspective has advantages for organisational learning and development of an organisation.

The observers' reflections included identified differences. These were in some cases based on the observers' own experience. One of the observers stated:

I am probably more like the second person and therefore I learnt more from the first one [Referring to chief of staff in the scenarios]. An error that the second chief of staff made, and I realise I always make the same mistake, is to be too involved and take the task assignment from those who really should do them, so that I could have more time for the command and control function.

Other reflections was made upon the differences that were discovered involved solutions to problems found by the participants and other possible ways of solving them. The solutions mentioned by the observers' mainly concerned internal issues, such as how to work with whiteboards and the allocation of work.

The observers mentioned that the role as an observer gave them more time to reflect on the cases as they did not have to handle the scenario themselves. One of the interviewed observers expressed it as *"If I am taking part in an exercise, I do not have time for reflection. I have to save that for afterwards"*. Instead, the observers had the opportunity to reflect before or in parallel with the progressing scenario. This means that the observers reflected before the outcome of decisions and acting were clear.

To be able to reflect during the crisis management exercises, the observers required knowledge of the system they observed. In their reflections, the observers often related to themselves or to their own organisation. One of the observers also expressed that *"it is important to have knowledge of their work to be able to reflect. It will probably be less valuable if you observe a completely different organisation"*.

Observers are not under the same pressure as participants to solve problems and issues in an exercise. For the participants the task at hand is more important than reflection on their actions, even if it is an exercise. The observers involved in this study could both reflect on how to act in the situation and compare this to how they themselves would have acted. This was expressed by one of the observers as *"the comparison to your own acting is made instantly, but you are not under pressure to act in the situation"*.

In two of the exercises, there was more than one person observing. In these cases, the observers also related their reflective process to the opportunity to discuss with others who made their observations in parallel with the scenario, which was described as positive by the observers.

There were opportunities for the observers to be creative by using an overview perspective to find other solutions to the problems that occurred in the exercise scenario. For instance, one of the interviewed observers pointed out the importance of viewing the situation from an external perspective and concluded that this is easier when observing and not having to focus on a more obvious task, as could be the case for those training. This was expressed as “*it was easier to think from a third person’s perspective, for example, with the bus crash. The exercise participants started to act and plan. I could empathise with them and think about how I would have reacted if my son was on the bus*”. Another observer reflected on previous experiences from another crisis organisation, but at the same time concluded that those might not be relevant for crisis management in the observed context.

Differences in learning

The respondents’ descriptions of what they learnt in the exercises imply that the participants focused on their own performance and capability to solve the tasks at hand. The observers focused on learnings and development for their organisation, but also their own learning (Table 2).

Table 2. Differences between participants and observers regarding described lessons.

Observers	Participants
How to train people in their own organisation	Practice their functions
Discover what types of equipment that could be used, such as whiteboards, maps, working space	Try things learnt from lectures or assessment reports in earlier exercises
Learn about another organisation	How they react under pressure
Roles and mandate of a municipality function	Using their organisation’s routines
How they themselves would act in a certain function	
Discover what methods could be used to solve the assigned task	

Even if there is time for reflection after an exercise, there is a difference between when in time reflections are made; during an ongoing event or after the event (Table 3). As the observers in the present study had time to reflect on the situation in parallel with the scenario unfolding, they had opportunities to find alternative solutions to problems the participants did not find due to the pressure of handling the situation. At the same time, the observers had a clearer view of priorities in the scenario and what should be done first to solve the crisis as best as possible. The observers identified lessons applicable to the organisational perspective and lessons for upgrading organisational procedures. By obtaining an overview of the exercise scenario, it is easier to spot processes rather than tasks. Still, the participants’ reflections on the applicability of the methods are useful in an evaluation.

Table 3. Differences between participants and observers regarding reflective capacity.

Observers	Participants
Make reflections in parallel with the scenario and reflect on different actions without knowing the outcome	Make reflections after the exercise when the outcome of the exercise is known
Make reflections and compare them to themselves or their organisation	Make reflections on their own performance (and in some cases relate these to their organisation)

It was difficult to discover creativity in the interviews and, consequently, differences between the roles (Table 4). Some of the answers indicate that the participants were creative in the way they used the organisations’ routines. The observers, on the other hand, were creative in the sense that they found other solutions to the problems that the participants were too stressed to find.

Table 4. Differences between participants and observers regarding creativity.

Observers	Participants
Do not need to handle situations and can therefore identify other possible solutions of the problem	Opportunity to adapt the routines in new ways

DISCUSSION

Exercises are an important means to achieve experiential learning, in terms of acquiring knowledge, behaviours, skills, values and preferences (Kolb, 1984). Thereby, exercises can contribute to the development and maintenance of organisations' capabilities, which is also valid within the field of crisis management (Silenas et al., 2008). However, carrying out inter-organisational crisis management exercises is costly and time-consuming. Hence, it is vital to gain the most out of these exercises. One possibility is to explore if other roles than the participants could learn from the exercises. The objective of the study presented in this paper is to explore whether there are differences in learning between participants and observers in crisis management exercises.

The result of this study shows that both participants and observers learn, but that there are differences in their learning. The participants described what they learnt in terms of how they performed during the exercise. They also expected to practice hands-on skills. The participants' learning was experiential in that they were learning by doing. This theory of experiential learning points out the importance of reflecting on an experience to be able to develop new skills and new ways of thinking (Lewis and Williams, 1994). The observers described gaining new insight when relating the performance of others to how they would have acted. The participants raised questions on how they performed, whereas the observers raised questions on how they would perform to achieve an optimal outcome if they were exposed to the same situation. This double loop oriented learning did not give the observers hands-on practise, but prepared them for handling similar situations in the future (Argyris, 1977).

The observers' main lessons learnt were more related to theories about organisational learning (Levitt and March, 1988). This could be due to their purpose as observers, since they wished to develop their own organisation through good examples by others. The observers mainly described their lessons learnt in terms of a possible upgrade of routines and methods in their organisations, rather than learning individual skills. Still, learning individual skills and improving organisations are both important for developing crisis management systems and enhance their capabilities for solving future crises.

Furthermore, the participants reflected on their actions when they knew the outcome of the scenario, which might have hampered any attempts to discover alternative ways of acting. The observers, who made their reflections in parallel with the scenario, evaluated alternatives with a more open mind. Kim (2014) described debriefing as an opportunity to discuss what happened during an exercise and what lessons could be learnt from it. In the studied exercises, no structured debriefing was carried out. However, debriefing sessions could provide a deeper understanding among both participants and observers, i.e. enhance the effect of reflection, due to their different input in the debriefing discussion.

Few interview answers related explicitly to creativity. The exception was examples where participants were creative in applying their routines. Still, creativity is important to effectively solve crises by applying rules and procedures in different ways (Woodman et al., 1993). However, the opportunity to be creative could be limited by the purpose of the exercise, if the aim is to train established crisis management routines. For the observers, creativity might accrue when they initiate the process of applying what they learnt in their own organisation. Still, there are opportunities for creative thoughts even when observing the exercise.

This study had an explorative design. Aspects that might have affected the outcome of the study are, for example, the different purposes for the partaking participants and observers. The aim of the exercise was too test municipality routines. For the observers, the purpose was mainly to find good examples to bring back to their own organisations. However, the results show that there are differences in learning outcomes between participants and observers. The role as an observer provides greater opportunity for reflection and organisational learning. Still, it is important to learn one's own function and how to handle pressure, which the participants pointed out as their lessons learned. As one of the respondents expressed it: *"It is an advantage to observe, but you learn by training also. You learn in different ways"*.

CONCLUSION AND FUTURE WORK

Adequate inter-organisational exercises are challenging and costly to implement. It is, thereby, important to get the most out of exercises. The conclusion of this study is that both participants and observers learn from exercises. Hence, from a financial and time-consuming perspective, it is vital to make use of the fact that others than those

participating learn from exercises. Therefore, exercise management, needs to consider how to create the best learning opportunities for all attendants when planning an exercise. An additional conclusion is that participants and observers learn different things, and they have different possibilities to reflect on events during the exercises. Hence, individuals participating in exercises can learn additional aspects of crisis management and execution of exercises by adopting other roles. As learning through exercises differs between different roles, actors in crisis management exercises need to have the chance to take on different roles to fully grasp all aspects of crisis management. This study was only concerned with what the participants and observers learnt. Future work is needed regarding what other actors, i.e. facilitators and evaluators, can learn.

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