IMPROVING LEARNING FROM EMERGENCY EXERCISES

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Abstract

Emergencies will occur, but exactly what will happen in the future is unknown. Although a specific emergency situation is unique the needs and problems society has to deal with when responding to different emergencies can be quite similar. It is thus possible to build up an emergency management capability based on recurring response needs. Emergency management exercises and trainings can provide valuable results in the form of strengthened emergency management capability both at an individual and organisational level. This requires that these exercises are regarded as situations with a great potential for learning. Unfortunately the full potential for drawing lessons from exercises is seldom used. Focusing more on strengthening learning at the individual level is one way to improve the lesson drawing. However, there is commonly too much focus on the specific exercised emergency situation and too little on the variety of possible futures. In the literature one principle to facilitate learning for the unknown future is the variation theory. According to this theory the learning process should be designed so that the dimensions of variation become visible to the learners. The objective of this study is to develop and demonstrate an approach for tabletop emergency exercises grounded on the variation theory. By an active use of the variation theory when conducting exercises the resulting approach develop the participants' ability to manage future emergencies.

Introduction

Trying to predict exactly what will happen in the future is appealing when preparing for managing future emergencies. But as Sagan (1993, p. 12) in his book about organisations and accidents describes it "…things that have never happened before happen all the time…". The difficulty lies in the fact that emergencies are unique and that it is impossible to predict the future with precision and certainty. On the other hand, even if any specific emergency is unique the challenges emergencies cause communities and policy-makers are to some extent general (Brändström et al., 2004). Quarantelli (1997) discusses two types of needs or demands that have to be dealt with when responding to emergencies, the agent-generated needs that the emergency in itself creates and the response-generated needs that is created by the response activities. The type of agent-generated needs that have to be dealt with during an emergency varies dependent of the type of situation. Response-generated needs are instead more or less generic, and the same needs tend to occur independently of the type of emergency. According

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to Quarantelli is it wise to focus on the generic aspects, the response-generated needs, when preparing for future emergencies.

Emergency management exercises are usually regarded as an important element in creating an ability to manage future emergencies. Emergency exercises and training can be structured in different ways, from tabletop to full-scale exercises (Perry and Lindell, 2007). To base exercises on emergency scenarios is common. A scenario is here seen as a description of the thematic content of what is going to be exercised.

A difficulty with exercises is to draw the full potential of lessons, and thus exercises are seldom as useful as they have the potential to be. An important part of exercises is the work that needs to be done afterwards based on the finding. Unfortunately, it is not uncommon that dysfunctions observed during an exercise never becomes managed and therefore are observed in the next exercise or actual emergency response (Robert and Lajtha, 2002).

The aim of emergency management exercises, for example tabletop exercises, is to prepare individuals to manage unfamiliar emergency situations. One principle that facilitates learning for the unknown future is the pedagogical variation theory. According to this theory learning about something is about experiencing it in a new way. How an individual experiences a specific situation is reflected by which aspects of the situation the individual is simultaneously focally aware of. To be aware of an aspect the individual must discern it from its context and simultaneously experience different values of it. The individual thus needs to experience different relevant dimensions of variation in the learning situation. Since experiencing a situation is a consequence of which aspects that the individual is aware of, two persons normally experience the same situation differently. In order for an individual to experience a situation in a new way, which learning is all about, she or he has to become capable of discerning more or other aspects than previously (Marton and Booth, 1997).

When designing a learning situation the desired capability for the learners should be the basis. It is essential that the individuals experience the aspects that are critical for their aimed capability (Runesson, 2006). The aspects that are critical should therefore be made figural in the learning situation, i.e. they must be varied. Since different individuals normally experience the same situation differently, working in a group is one way for the individual to experience a broader variation (Marton and Booth, 1997). The use of variation aims to improve the individuals' ability to discern critical aspects in a novel situation (Bowden and Marton, 2004).

The objective of this study is to develop and demonstrate an approach for tabletop emergency exercises. The resulting approach aims at improving learning from exercises at an individual level. This is done by an active use of variation theory in the design, implementation and evaluations of the exercise. The advantage using variation theory is the possibility to improve the individuals' ability to manage also other emergencies than ones that correspond to the exercised scenario.

The approach

The proposed approach for tabletop exercises to improve learning consists of three steps; preparing the exercise, conducting the exercise itself and evaluation of the exercise including disseminating of the results.

Step 1: Preparing the exercise

Before starting to prepare any specific exercise is it important to carefully define the aims and the goals of the exercise. Central criteria when defining aims and goals are the presumed roles and tasks in future emergencies that the participants in the exercise might have. Also the participants' needs for appropriate competence to manage their future roles are decisive when deciding aims and goals.

The primary task in preparing the exercise is to develop and describe a main scenario. A scenario is here seen as a description of the thematic content of the hypothetical exercised emergency. For example, previous emergencies, risk analyses and vulnerability analyses can be used as inspiration when developing the main scenario. The scenario is modelled as consisting of different parameters, each representing an aspect of the scenario. The main scenario description thus consists of a set of parameters, all assigned starting-values. All possible aspects of a scenario can be represented as parameters. In an emergency scenario a parameter can for example represent the temperature, the number of injured people or the number of people available for responding to the emergency. The parameters can in an emergency context be divided into agent-generated parameters, response-generated parameters and context parameters. Summing up, the main scenario is thus described by several parameters and their hypothetical values.

The aims and goals of an exercise should be the basis when identifying which parameters that are presumed to be especially important for the individuals in the exercise group. In line with the variation theory the aspects that the individual need to discern in order to develop the sought capability (understanding of the situation) should be used as parameters when describing the main scenario. Which parameters that are important for the group is determined by for example the participants' planned roles in future emergencies. Besides identifying a set of parameters that build up the main scenario it is also essential to identify how the different parameters values might vary, and identify possible ranges. For example how will the parameters vary over time?

Step 2: Conducting the exercise

The actual exercise occasion is conducted as a tabletop seminar. Individuals familiar with the main exercise scenario, for example individuals involved in the preparation step, chair the seminar.

During the exercise it is important that the scenario used is made explicit, i.e. the selected set of parameters and parameter values in the main scenario should be clearly stated for all the participants. The point of departure for the discussion is variation of values of the parameters describing the main scenario. During the discussion it is important to be distinct with the parameters that are discerned as important. This is done by explicitly and systematically varying the values of these parameters. The aim with an explicit use of parameters is to enhance the learning from the exercise. By presenting parameters new for an individual and explicitly varying them the individual is encouraged to discern critical aspects of the situation in a developed way.

Different individuals have different capabilities and an advantage with working in groups is the possibility to learn from others. According to the variation theory, discerning how a situation appears to others provides the possibility for an individual to experience other maybe new aspects of a situation (Marton and Booth, 1997). The most vital part of the exercise is a discussion of parameter values and sets of parameters that are identified by the participating individuals. This is done by using "what-if thinking" in the discussions. In the discussions both the participants' professional skills and their experience of emergency management are essential. By involving the participants an identification of other relevant parameters than the main scenario description is encouraged, and thus alterations of the parameter set results.

Which parameters that are especially critical to experience for successful managing of future emergencies is hard to determine by a small preparedness group beforehand. In addition, there is in general no single "truth" of what is important. To discuss the participants understanding of which parameters and parameter values that seem to be critical will enrich the scenario description. By working in group the result becomes anchored in the collective competences of the participants. However, the final scenario description that is developed during the seminar is not conclusive. There may be other possible equally good descriptions. To reach a complete consensus in the group on how a final, 'ultimate' scenario description should look

like is neither possible nor desired. What parameters that describe the critical aspects of the situation may vary depending on the composition of the group. Crucial is instead the act of collective interpretation and the associated construction of collective meaning. If individuals are given appropriate conditions and time they are often capable of developing relevant meaning structures for their field (Dixon, 1999).

Step 3: Evaluating and disseminating

The perhaps most important result of the exercises is that the participating individuals' competence and understanding of the exercised scenario have increased through the distinctive and explicitly elaborated variation. A further expected ability is that individuals learn to discern critical aspects also in other scenarios than the one exercised, so that they become better at managing future emergencies.

Another result of the exercise is an official report containing a summary of the collectively developed scenario (the main scenario and some of the more prominent variations, i.e. the possible sets of parameters and parameter value ranges). This report can further be used as a basis for improvement of e.g. emergency planning and future exercises.

The exercise also needs to be connected to the overriding emergency management process. This will enhance the usefulness of the exercise at an organisational level. There is for example a need to actively spread and transfer the result throughout the organisation. Apart from spreading the report from the exercise this can be done thought e.g. carrying out seminars and having exercises in other group constellations.

To further enhance learning one or several feedback meetings should be held. At these meetings a discussion can be based on the official report of the exercise. Do all participants have the same picture of the exercise as the official record? During the feedback meeting, it is also important to go back to the aims and goals of the exercise and discuss if these have been achieved.

Discussion

To use tabletop exercises in emergency management is common. But commonly they do not have a conscious focus on creating learning at the individual level, as the approach proposed in this article has. The aim of the use of the proposed approach is to increase the participating individuals' competence and understanding of the exercised scenario and develop their ability to experience variation in also other scenarios, thereby developing their ability to handle the unknown future. By implementing the proposed approach on real exercises it is possible to further improve its ability for learning.

The proposed approach for exercises is scientifically rooted in the established pedagogical variation theory. Variation theory has been used in educational research in different forms of educational establishments such as higher education (e.g. Marton and Booth, 1997; Pang and Marton, 2005). A related approach, using variation theory as a foundation for evaluating emergency responses, has also been tested in a couple of emergencies with promising results. Individuals participating in these evaluation processes have expressed that the discussions in terms of variation of parameters and parameter values have broaden their views (Borell and Eriksson, 2008a, b).

In this paper, the focus has been on using the dimension of variation around a specific emergency scenario to enhance learning. Beyond the principle of variation, several other adjoining pedagogical principles define aspects crucial for learning. Examples of such principles are building a relevance structure, gaining deep-approach to learning and gaining a holistic approach to learning. To further be able to strengthen individual learning in exercises, some of these principles will be implemented in a further developed approach.

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