

# Supporting Instructors in Conducting Exercises

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### ABSTRACT

Planning, designing, facilitating, and evaluating are central activities for instructors when conducting exercises. When conducting these activities, instructors usually rely on past experiences since structured educations or guides for instructors do not exist. It is therefore evident that there is a need for such educations or guides.

In this study, the contents of a guide for instructors are proposed. The contents are based on seven semi-structured interviews with novel and experienced instructors, where they were asked to map their procedures for conducting exercises through a journey map. The interviews resulted in material which was transcribed and analysed using a thematic analysis. The thematic analysis emphasized five themes to consider when acting as an instructor, namely *roles, realism, defining purpose and goals, learning, and planning and acting*.

The results from the interviews, combined with past literature, resulted in proposed contents for an instructor's guide which is currently being developed.

### Keywords

Instructor work, Simulation, Crisis management, Exercise, Learning

### INTRODUCTION

Training to be prepared for managing crises is important for command and control teams. As crises are rare, unique, and unpredictable (Walker et al., 2011), training needs to be designed accordingly. One way to mitigate negative effects of a crisis is through simulation exercises (Skyabrina et al., 2020). Simulation in this study is defined as an activity that tries to mimic the real world as a tool to solve real world problems (Rybing, 2018). In most simulation exercises, the instructors, or facilitators, play an important role. Hence, this paper relates to how command and control teams can be trained, especially the instructor's role in conducting exercises.

Bell and Valley (2020) distinguish between three separate phases of simulation: the planning phase, the conduct phase, and the evaluation phase. It is important that all these phases are closely knitted together to create a purposeful exercise that increase learning outcomes. During the planning phase, the planner needs to specify purpose and goals of the simulation. In educational exercise material from the Swedish Armed Forces (FM, 2013) it is stated that the purpose should answer the question why practise is required, and the goals should answer what should be practised. Clear and general goals lead to enhanced effort and performance but does not limit an

individual in how to behave within an exercise to reach the goal (Garris et al., 2002). A simulation that strives to exercise participants also needs specific defined learning goals (Strater & Bolstad, 2009). Biggs and Tang (2011) offer a pedagogical way to define learning goals with the Structure of the Observed Learning Outcome (SOLO) taxonomy. This method involves choosing applicable verbs on the different levels of the taxonomy. Biggs and Tang recommend that writing a learning goal should be done by first defining type of knowledge: declarative or functional. Second, a suitable verb should be used from one of the SOLO-levels, specifying level of required understanding. Third, a content topic should be included, specifying what should be performed. Last, it must include the context in which the action should be performed.

Designing for a simulation can be difficult (Hofstede et al., 2010). The designer is required to have extensive knowledge about what is to be modelled and capture the essence in scenario-making and what to consider when giving roles to participants. When designing a scenario, the designer needs to consider at least four things (Walker et al., 2011). Even though the crisis cannot be considered probable, (1) it must be possible. The behaviour in the simulation must match real-world behaviour. Second, (2) the scenario cannot contain contradictions. There should not be elements in the scenario that go against each other or the real world. Third, (3) the scenario must be credible. Lastly, (4) the scenario must be relevant and align with the goals of the simulation.

During the conduct phase, an instructor facilitates the participants through a scenario. Jansen and van Zelst (2021) argue that good facilitation during simulation is key to achieve the learning objectives of the simulation. For example, if the participants' focus start to ponder away from the simulation's intended purpose or if they neglect retrieving an imperative message, an instructor can step in to guide the participants into a more purposeful direction. This is what van Laere et al. (2021) calls on-the-fly facilitation. They argue in their article that facilitation during simulation is muddy and complex, and difficult to define in empirical research. They therefore call upon more research about the subject, as instructors today can mostly rely on their experiences. Jansen and van Zelst's (2021) findings show how instructors take different roles during simulation, such as instructor, supporter and as problem creator. Experienced instructors might find it easy to read a room and choose a fitting facilitating role, but novel instructors might not find it quite as clear (Kriz, 2010).

Evaluation is both done through observation during exercise and through reflection with participants in group, a so called debrief. Bell and Valley (2020, p.67) define a debrief "*as a process that purposefully explores the participants' experiences in the exercise to elicit learning, typically focused on the intended learning outcomes*". During a debrief, the participants are forced to analyse, diagnose, and find suitable solutions to critical situations (Kriz, 2010). Undertaking a debriefing session, participants also reflect on the consequences of their actions and share their experience and consolidate knowledge between each other. Garris et al. (2002) claims that a debriefing session is an essential part of a simulation. A debrief should be pre-planned and structured. One way to conduct a debriefing session is through an After Action Review (AAR; Sawyer and, Deering, 2013) which includes answering questions like "what was supposed to happen, what actually happened, what went well, what didn't go well, and what would the team do differently next time if faced with this same situation in real life?".

Data retrieved from evaluation can be quantitative when using performance measures for example, and qualitative from discussion. The aim of evaluation is learning (Swedish Civil Contingencies Agency, 2017), including individual development (Bell & Valley, 2010), but also organisational learning as performance is evaluated for organisational development purposes (Gryth et al., 2010). Focusing on performance in simulation, instructors can formulate indicators which elicit quantitative data on performance. Indicators are used to reveal which activities that enabled or hindered a prominent outcome. Rosen et al. recommend eleven best practices that a planner should undertake when constructing team performance indicators (See Rosen et al., 2008).

## Synthesis

In short, instructor work requires experience and knowledge in both crisis- and exercise management. Planning, designing, facilitation, and evaluation are central aspects for instructors that conduct exercises (Bell and Valley, 2018). This is often developed through work related experience among instructors rather than structured education and training to become proficient instructors (Hofstede et al., 2010).

This paper uses the Emergo Train System (ETS) instructor community as a case and empirical foundation for understanding the work of instructors conducting exercises. Emergo Train System is a low-fidelity simulation platform for conducting exercises, mainly in pre-hospital management and surge capacity at hospitals. Focus is on resource management, communication, decision-making, logistics, and teamwork (Waring et al., 2021; Crombie et al., 2020; Lennquist, 2003). ETS has been used for preparedness exercises, burn disaster planning, and management of crises (Nilsson et al., 2013; Gryth et al., 2010; Nilsson, 2012). Instructors usually take one course and is then expected to run their own courses, and research shows how the instructors need additional guidance regarding planning, conducting, and evaluating exercises (Halvorsen, 2020; Berggren et al., 2022).

## Purpose

The purpose of this study is to map the process of ETS instructors' work, and structure the findings into a coherent description for a future guide that is useful for both novel and experienced instructors in ETS.

## METHOD

### Design

Seven semi-structured interviews, lasting between 45-65 minutes, were conducted. All interviews were transcribed focusing on content. During the interviews the participants were asked questions about the process of instructor work. This included questions about receiving an order, planning a scenario, facilitating an exercise, and evaluating the exercise.

During the interviews, the participants were presented with an actor's map and were encouraged to place presented actor-suggestions in proximity to themselves. Actor's map, also called stakeholder map, demonstrate which actors that are involved in the work process and prioritise their relevance (Stickdorn et al., 2018). The participant is in the middle of the actor's map and can place actors in different sectors in proximity to themselves dependent on project purpose.

In addition to the actor's map, the interviewer asked the participants to describe an exercise process by reminiscing an old exercise or hypothesise what a typical exercise could look like. While the participants were describing the several steps taken and answering questions posed by the interviewer, they were encouraged to write notes together with the interviewer. The notes were outlined into a journey map. The concept of creating journey maps stems from service design (Stickdorn et al., 2018) where researchers try to identify touchpoints in a customer's journey of a purchase for example. In the current study, the journey map was used to identify all steps taken when conducting an exercise from an instructor's point of view.

### Participants

Participants were recruited through convenience sampling and snowball sampling. Seven ETS-instructors were interviewed. Two of them were novel instructors and five were experienced instructors. The novel instructors had partaken in one ETS Surge Capacity course or the ETS Senior instructor course in the last two years and had never held an ETS-exercise outside the courses. The experienced instructors had worked with ETS for more than four years and had held exercises in ETS. Five of the instructors were from Centre for Disaster medicine and Traumatology (KMC) and two were external. One worked as a manager at a hospital, two as contingency strategists, and four as teachers in disaster medicine. They represented different instructor domains in ETS use, pre-hospital command and control and senior instructor faculty members. All had a background as nurses or as paramedics. Four of the instructors were women and three were men. Their age was between 35 – 51 ( $M=42,7$ ,  $SD= 5,3$ ).

### Analysis

The interviews were transcribed and analysed using reflexive thematic analysis (TA), as described by Braun and Clarke (2022). The gathered data was transcribed and inserted into a program for thematic analysis. The steps taken during analysis were guided by Braun and Clarke (2006) guidelines:

Step 1. Familiarization with the data was done through mapping and merging of the participants' journey maps. It was also done through transcribing and reading data.

Step 2. Generating initial codes was performed both inductively and deductively, thus driven by both data, purpose of study and the analyst's earlier understanding of the subject.

Step 3. Searching for themes was accomplished by reading each code searching for overlaps between the codes, and then creating sub-codes. This step is not described in Braun and Clarke (2006). The sub-codes showed where overlaps were and which codes that were unique.

Step 4. The reviewing themes included overseeing all collected themes and value if there are enough data to support each theme and get an overview if the themes are coherent.

Step 5 and 6. These steps, defining and refining names, were done simultaneously. The themes were mapped together with sub-themes and described in the report. Lastly, the quotes presented in the report were translated from Swedish to English to suit an English-speaking audience. The translation was somewhat direct which meant that some formulations by the participants can be considered odd to a non-Swedish speaker.

## Ethics

All participants signed an informed consent. No sensitive implications were identified.

## FINDINGS

Five main themes were generated in the thematic analysis: *roles, realism, defining purpose and goals, learning, and planning and acting*. One summarised journey map was created and is presented in Figure 1.

### The Instructor Journey

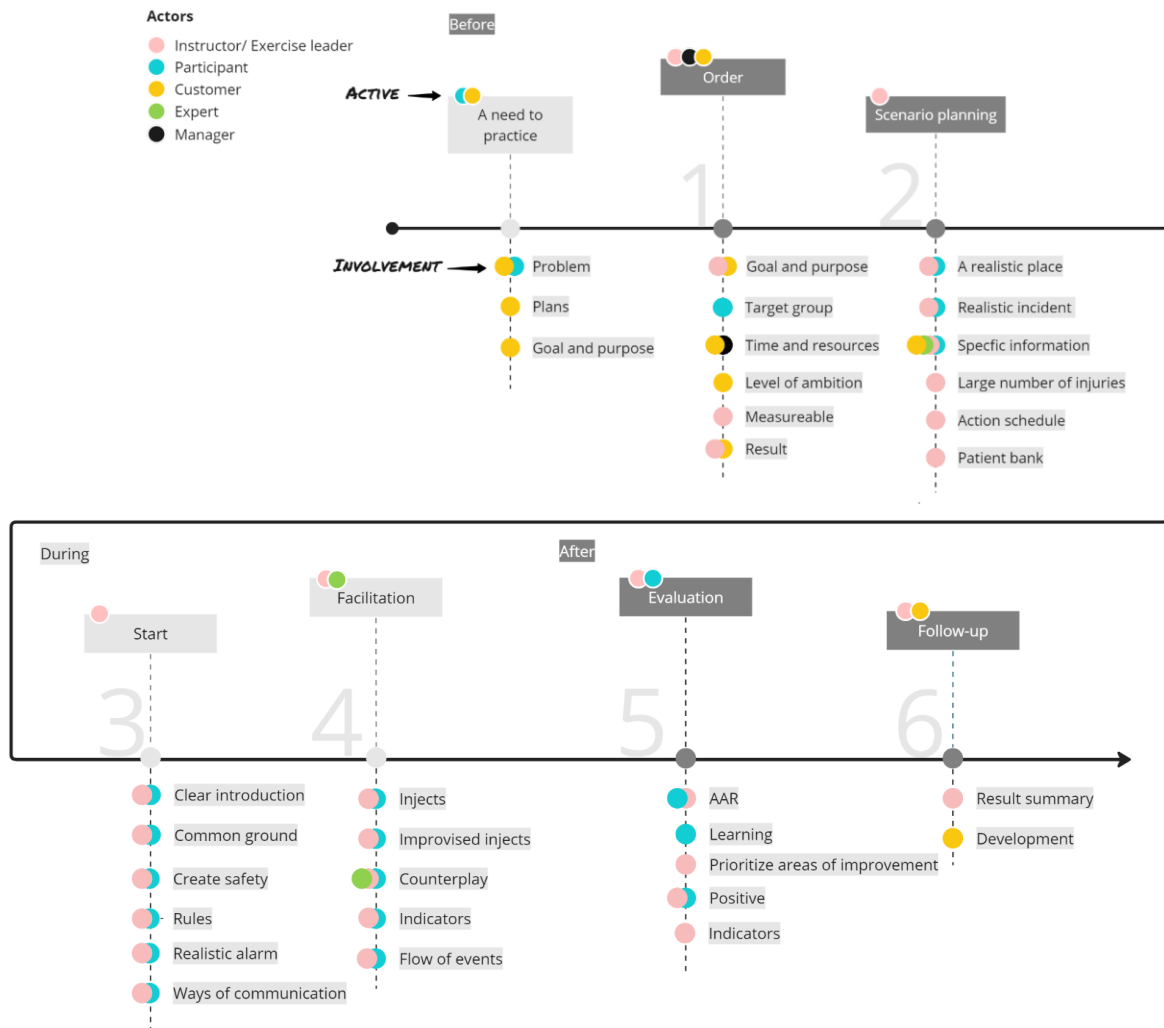
The interviews resulted in seven journey maps which were plotted into a digital whiteboard and merged into a single journey map with all notes together and then scaled down into a summarised journey map, see Figure 1. This was done by identifying overlaps between descriptions and creating overarching titles for themes on the same subject. The journey map consisted of three higher level phases: Before, During and After exercise. Each phase had different steps involving different actors.

The first step, before, began by identifying a need for an exercise, which for example could stem from an identified problem. The customer defined purpose and goals for the exercise and ordered the exercise via the manager of the instructor. The customer and the manager defined time and resources for conducting the exercise. The instructors were involved in defining purpose and goal, required results and level of ambition.

During scenario planning the instructors considered realism regarding profession, place, and incident. They gathered information about participants from the customer, and potential crises from experts to make the scenario realistic and suitable to the target group. At the beginning of an exercise the instructors gave the participants a clear introduction, explained the simulation form, and how communication would work during exercise.

During the exercise, instructors facilitated by injecting pre-planned events into the scenario. Sometimes, the instructors needed to improvise to keep the participants within the purpose of the exercise, making the scenario flow. The instructors also engaged in role-play, called counterplay, where they played roles required during a crisis. These roles could also be played by professionals. The instructors observed and evaluated using measurable indicators. These indicators, as well as the injects, were written in chronological order according to how the scenario was planned to unfold.

Evaluation was done through an AAR, which enabled participant self-reflection, important for learning. The instructors revised the results from the indicators with the participants, prioritised areas of improvement and made sure to give positive feedback. The result from the evaluation was summarised according to the customer's wishes. Based on the result, the customer could then specify plans to develop the exercised organisation further.



**Figure 1. Instructor journey map. Summarised journey map. Actors in coloured circles showing responsibility and involvement in the different phases, and numbers showing phases where instructors are involved.**

### Thematic Analysis

Five themes were gathered from the thematic analysis. The themes are *roles*, *realism*, *defining purpose and goals*, *learning*, and *planning and acting*

### Roles

During the interviews the instructors were presented with an actor’s map and had to place predefined actors in proximity to themselves based on involvement in exercise management. The instructors were encouraged to motivate their choices, which induced conversations about roles.

The instructors explained that they had different roles depending on exercise purpose. One instructor explained how during learning exercises his role was similar to that of a teacher, responsible for guiding and interfering to support learning. However, he acted differently when the purpose of an exercise was to test a system rather than teaching participants. Then, he would closely follow the exercise’s action plan and only improvise and interfere during doldrums. Almost all instructors identified themselves as exercise leaders, where their main role was to oversee that the scenario ran smoothly. The instructors did not agree upon if planning was done by the exercise leader or an instructor, where one stated that instructors never planned exercises and another stated that only larger

exercises demanded an exercise leader. Larger exercises could also require a coordinator who managed the logistics around the exercise. Another role that an instructor had during and after exercise was the evaluator role, which was considered important.

*I2: The evaluators are always overlooked. They are as important as the instructors. Without evaluation, the education is meaningless. So they are... No, in many parts more central or as central as the instructor here. After all, these are to some extent contradictory roles. Instructors, evaluators. The concept of the instructor is more when we educate, that is, if we educate in moment exercises and so on. Then we have an instructor who also evaluates. Then it synonymous as we have an ETS exercise and he is an ETS instructor. It's a little more unclear because then I might see that the instructor, if you have a testing exercise, you should have quite little involvement of the instructor. Because then it should... then you should be faced with a scenario that is so well thought out that the participants drive the exercise forward.*

The instructors received orders for exercises from customers via the instructor's manager. The manager and the customer were responsible for defining the frames for the entire exercise project. The customers were not involved in the exercise management, but due to their leading positions they were responsible for defining purpose and goals for the exercise to suit their organisational and employee needs. Participants were central to the exercise and were involved as a target group before simulation, took part in the simulation and in the debrief. They were highly involved in the learning process, both individually and as a representative for the organisation.

*I3: And it is always the customer who orders and their participants but what I mean is... It may be that there is an obligation that everyone must have this education, for example, that everyone should go through on an annual basis. How the flow in a major incident works as you find gaps within and be able to fix it and then it could be that every year this must be done.*

Subject matter experts were also involved in creation of the exercise. They were called on for help regarding specific questions about simulation or factors regarding scenario creating and aided the instructors in counterplay during exercise. Sometimes exercises could have stakeholders and the general public observing the exercises.

### **Realism**

Realism was taken into consideration during the scenario planning, the construction of the scenario aesthetics, and the communication during exercise. Information about participants was gathered to increase realism, such as participant profession, workplace, and geographical surroundings. It was important that the participants could relate to their role, recognise their workplace on whiteboards, and acknowledge the events happening in the exercise.

*I2: It is difficult... I will not say the most difficult, but it is one of the more recurring. It is those that have never worked with simulations of this kind before. Getting them to get involved with their heart and soul and it's usually a problem only the first few hours. Then we can see that everyone... we do not get them to stop. This fidelity is so high, like after a while, because they are so into it, and we can say that the exercise is over but it feels... they aren't done [with the exercise].*

Furthermore, information about possible crises was gathered from experts or previous crises. The gathered information demonstrated how a real scenario could unfold and was used to make events in the scenario accurate to the real world. However, which type of crisis mattered less, only if the effects followed by the crisis was relevant to the purpose, the goals, and participant profession. The instructors emphasised communication in the exercise should be done as close to reality as possible, because participants should practice the complexity of communication during a crisis.

### Defining purpose and goals

Purpose and goals are defined together with the customer. The interviews emphasized that the instructors believed that purpose and goals should be defined by the customer. However, it was also mentioned that it can be beneficial if instructors had the necessary competence to aid customers when defining purpose and goals. It is important that the purpose and goals are contemplated thoroughly and defined clearly. The instructors stated that this is the most difficult task during exercise planning.

*17: It's difficult before purpose, goal, learning goal. It is absolutely the most important thing because if those are set, the rest will come. Because, to pick out patients and to paint the whiteboards, like an inventory about conditions, that is, that's the simple part.*

### Learning

Learning is part of all exercises, but the instructors recommended differentiating between two types of exercises, learning and testing. They stated that if an exercise is a learning exercise the purpose is to educate and develop individuals, the purpose of a testing exercise is related to organisational learning. Throughout the interviews it was expressed how learning goals were used during courses and learning exercises, not for testing exercises. However, it was not clarified what learning goals were, if they were overall learning goals for an exercise or indicators used during exercise, or both.

*14: And then we have our quality indicators, so we have learning goals for local regional level TiB [Designated duty officer] and PS plus [advanced pre-hospital command and control course]. So yes, we have learning goals.*

*Interviewer: And they are already set from...*

*14: The national model*

*Interviewer: mm. the guidelines that exist.*

*14: So really. We have no specific learning goals for the exercise, but we always have learning goals in the form of indicators. So, we will measure indicators both at the local level, regional level and pre-hospital level.*

Preparations were done before exercise to optimise the learning potential. The instructors adjusted their exercises to suit participants' level of knowledge. Adjustments could also be made by preparing the participants for the exercise, including both the simulation form and the subject of exercise.

It was also stated that evaluations are important for learning. Evaluations were mostly done together with participants using the AAR method. The instructors recommended prioritising giving feedback to the participants and to always give positive feedback at the end of exercises. Positive feedback was seen as beneficial for learning by creating a safe learning environment, where participants felt they could act, make mistakes, and self-reflect. A safe environment was more important during a learning exercise than during a testing exercise.

*12: If it is a learning exercise, it is a slightly different climate, and you shall create... Then it becomes much more important with this safety creation. Creating safety around the participant so that they also feel that the exercise actually exists for this individual to learn something.*

### Planning and acting

Planning and acting covers instructor tasks during the exercise. The instructors planned injects in an action schedule along with their scenario planning. These injects were events in the scenario that they brought to the participants' attention. The injects should always have a purpose and be realistic. Injects could also be improvised to aid participants, when the scenario comes to a doldrum or to keep them within the frames of the scenario. The instructors claimed that improvisation could be tricky and presented several tips on how to manage difficult situations. One tip was adding difficulty by adding more patients, another was to hold a press conference to summarise the situation, a third was to highlight severity of an accident to later stages in the care chain by instructing earlier stages.

*17: ...because then you go back one link in the chain and try to strengthen up there. Do not say to her; "you, with this information you should..." but more like, back a link in the chain. If it is like that, you haven't really been clear with the scenario itself, that is. It's like this. Now the situation is so damn bad on injuries at the scene of the incident, so then I go to the scene and I say like this "You. I think that, you know, you need to put pressure here*

*or can you, can you contact them again and sound a little more hysterical in your voice?"  
To, in some way, back a link in the chain to like "but god, I might have to send the alarm  
further" and then we are up and running.*

The instructors acted in different counterplay roles during the scenario. These roles should be planned before exercise, so responsible instructors could prepare to convincingly act as the role. The roles played were often Designated duty officer, intensive care unit, surgery unit, and emergency number operator, and could be played by one or many instructors or experts.

## DISCUSSION

This chapter includes a discussion regarding the purpose of the study, to map the instructors' work and how to conceptualise the findings into a coherent description for a future guide.

The instructors' description of the exercise process can be separated into the steps described by Bell and Valley (2020): planning, conduct and evaluation. The first and the last steps of the journey map visualise how conducting and managing an exercise is part of an overall process. For example, how the customer identifies a problem and chooses to use an exercise as a method to correct a problem and how the evaluation of the exercise play an important role in how changes can be made within the customer's organisation. This overall process defined and encapsulated the work of the instructors and was therefore incorporated into the guide so that the instructors receive an overview of the entire process of conducting an exercise and which actors that are involved during each phase. This means that the phases described in the guide are six in total, as subsections to the steps described by Bell and Valley (2020). Planning the exercise became two steps, separating formulating goals and purpose and scenario planning. Conducting an exercise was separated into introduction and execution, emphasising the need for participant common ground before an exercise. Evaluation was included in the guide along with the important last step, spreading the result to the customer, focusing on organisational learning (see Beerens et al., 2020).

The importance of defining clear and coherent goals stated by Garris et al. (2002) was supported by the interviews. However, how to formulate these was not presented in the interviews. The instructors also emphasised the difficulty to define sufficient purpose and goals. Therefore, guidelines for defining purpose and goals were gathered from supporting documents in exercise management literature (see Homeland Security, 2020; Nilsson & Kristiansson, 2015; FM, 2013; Swedish Civil Contingencies Agency, 2017) to aid instructors in this process.

The instructors differentiated between learning and testing exercises and this separation altered their conduct through the entire process of exercise management. For example, a learning exercise focused on the individual participant's learning and a testing exercise regarded organisational learning. The instructors highlighted the need for learning goals during learning exercises and disregarded them from testing exercises. There was an ambiguity in the results regarding how the instructors defined learning goals, since one of them likened them to indicators. This notion contradicts the description of indicators by Rosen et al. (2008) which state that indicators should be based on learning goals. Since learning goals and indicators are different types of performance measures, a separation between indicators and learning goals was made to the guide, with recommendations based on Biggs and Tang's (2011) formulation of learning goals and Rosen et al.'s (2008) practices for creating performance indicators. Moreover, the results show how instructors act differently dependent on type of exercise. During a testing exercise, all injects were carefully planned, and the participants moved the scenario forward without support from the instructors. During a learning exercise, the instructor took a more supporting role. This is similar to what Jansen and van Zelst (2021) cover in their study, but somewhat more or less support or problem creation dependent on type of exercise, and not only during different phases of the exercise as described in their article. This thorough differentiation between conduct regarding learning and testing exercises has not earlier been described in empirical research, to the knowledge of the authors.

Information about facilitation during exercise is scarce in the scientific literature. Hence, the results about instructor facilitation in this study is a contribution to the field. The instructors presented several recommendations about on-the-fly-facilitation, when a scenario comes to a doldrum or how to re-direct participant attention to keep them within the frames of the scenario (van Laere et al, 2021). These recommendations contributed to the guide in similar manner to the do's and don'ts in Grunnan and Friedheim (2017).

The instructors took realism into great consideration when designing a scenario, much like the three first points described by Walker et al. (2011). A difference between the instructors' descriptions and literature is why realism is required. As one instructor stated that since ETS as a simulation tool is very unrealistic, everything else must be realistic. Because the physical fidelity of ETS is low, it requires high functional, task-related and role fidelity. These findings are in line with the description of mimicking processes in management described by Feinstein and Cannon (2002) but they highlight learning as the main reason for focusing on task-related fidelity since high physical fidelity could cause high mental workload to novel participants. When designing a scenario, instructors



mimic real crises and base the response of the crises on organisational plans. This enhances the task-related fidelity, as the events of the simulation and the expected participant actions correspond to participant reality. The instructors consider functional fidelity when acting as counterplayers, for example, they study how to act as a certain role before simulation and are mindful to give the right feedback to the participants. The instructors also spoke of how they have experienced the importance of role fidelity and emphasise its importance for the felt realism (see Grunnan and Friedheim, 2017; Harder et al. 2013).

### Contemporary and future work

The guide was reviewed by instructors in the study and other experts at KMC as well as circa 60 preparedness management personnel and pre-hospital command and control personnel at the Swedish national conference for pre-hospital care faculties. The guide was well received by all parties and will be spread within the pre-hospital faculty and ETS faculties around the world. It will be translated from Swedish to English and shall continue to be developed further within and by KMC. To increase the usability and validity of the guide, further research regarding instructor roles and facilitation is recommended as well as how to discriminate between evaluation of practical and theoretical knowledge and characteristics of levels of performance.

### CONCLUSIONS

The purpose of this study was to map the process of instructors' work and structure the findings into a coherent description that is useful for both novel and experienced instructors. The study has mapped the instructors work process, including relevant actors and an initial guide for exercise management has been written. For the first time an ETS instructor's work process has been visualised which can be used to guide future ETS instructors. The greatest contributions of this study are (1) descriptions of difference when conducting learning and testing exercises, (2) the support of defining goals in the guide, (3) the immense considerations during scenario planning regarding realism, and (4) proficient conduct of managing complex situations during exercises.

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