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Improving an Observation Tool of crisis management teams by involving Crisis Managers

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In the frame of the CRIZ'INNOV project, IMT Mines Ales is in charge of developing an observation tool in order to enhance vocational training of crisis managers. Using a research approach articulating research-design-training, the cooperation between Researchers, Engineers and Crisis Managers is fundamental. With co-design goal, the first step was to meet potential users and integrate their in everyday work practices. To reach this goal, interviews and observations were realised. Results allowed to identify needs, practices and to assess observation's tool feasibility. These first outcomes have oriented characteristics of observation tool.

1. Introduction

Training crisis managers is a major challenge in optimizing crisis management [Direction générale de la sécurité civile et de la gestion des crises, 2020]. Ongoing training of crisis managers regularly takes the form of a workplace exercise in which crisis actors act as if the simulated phenomena were real. This kind of exercise, called functional (Trnka and Jenvald, 2006), allows to replicate the actions and interactions that a crisis unit would experience in the event of real crisis management (Tena-Chollet et al., 2017).

1.1 Crisis exercises challenges

To prepare for the management of crises such as those that may result from technological accidents or natural disasters, decision-making teams can be immersed in a simulated crisis situation. The use of simulation in vocational training is commonly used in high-risk areas such as health (Horcik et al., 2014), military (Bisschop and Leblanc, 2022) or public safety (Sauvagnargues, 2018). This pedagogical format is based on a principle of fictitious experience that encourages participants to act as if the simulated crisis were real. Therefore, on the basis of a crisis scenario, the decision-making team can be activated to play its own role and train. (Fleming et al., 2020).
Civil or industrial authorities propose frameworks to guide the implementation of exercises (e.g. Federal Office of Civil Protection and Disaster Assistance, 2011). These scoping texts highlight the planning, preparation, conduct and analysis phases of exercises. They also present the different roles played by exercise facilitators, players, observers and evaluators. While these texts provide an overview of the implementation of the exercises, they are not sufficient to develop and implement observation activities.
Research on vocational training through simulation highlights different aspects of this pedagogical approach: the design of scenarios (Limousin et al., 2018), the development of team skills (Crichton, 2009), the place of debriefing in the simulation (Fanning and Gaba, 2007; Gardner, 2013). This researchs focuses on the relationship between the exercise phase and the debriefing phase to support the development of participants' skills. This concern for the relationship between play and debriefing is also present in health training (Abelsson and Bisholt, 2017). It raises the question of the relationship between observations and discursive reflections. The debriefing should allow to review the actions carried out during the simulation in order to discuss them and improve the team's performance. The content of the discussion is therefore based on the different observations and their memorization.

1.2 Importance of observation

To provide a common frame of reference for the analysis of exercises, Jenvald and Morin (2004) propose an impartial observation method based on multiple data sources including observation data. Audio-video recordings

and observation records are used to compile data for the purpose of constructing a global view of the exercise to support debriefing (Jenvald and Morin, 2004). This systemic approach is in line with the idea of defining the objectivity of observation by "an interpretive movement that develops in the intersubjective relationship between the observer and the observed in an observation situation" (Bonnemain et al., 2015, p. 102). Therefore, objectivity of observation is not a position of overhang of an expert view but rather a dialogue between the different sources of observation and construction of traces of activity. This approach to objectivity is linked to the notion of interpretation of giving meaning to what is observed (Norros, 2004).
Referring to different observation tools, Lapierre (2016) developed observation grids for evaluation and debriefing assistance. In order to do this, the author created a reference framework for the work of crisis management teams, classified into 3 axes, 17 missions, 64 objectives, 192 learning objectives, 6 categories of knowledge and 15 skills. One of the interests of his research is to conceive the observation within an approach that integrates and links exercise preparation, observation and exercise implementation. Thus, the observation is divided between players, facilitators and observers in order to foster the reconstruction of a global vision of the experienced exercise. However, one of the limitations of this tool is related to the segmentation of actions which makes them lose visibility in their context of appearance.

2. Theoretical and methodological framework

In order to offer a complementary entry to the work already carried out in vocational training through simulation and in the conceptualisation of observation tools, an anthropo-technological approach had been chosen, as defined in the research program for the chosen 'course of action' (Theureau, 2002).

2.1 The consequences of an "activity entry"

This approach considers activity as the dynamics of the actor's interactions with his environment. According to enaction paradigm (Varela and Maturana cited by Theureau, 2002), these interactions emerge of couple actor-environment in the situation.
Although it is the learning of the crisis management team that is targeted, the hypothesis put forward is that this development goes through the activity of observing the crisis exercises. Thus the crisis exercise observation activity was considered as a work to be paid attention to. This activity is considered both individual and social. As such, the activity of the observer is intrinsically linked to the activity of the crisis management team observed during the exercise. This observation activity is also finalized and inscribed in a culture: the observer is expected to report on his observation in order to participate in the improvement of the collective. Following advices of Flandin et al. (2018), "support participatory-sensemaking and collective sensemaking" is an adopted principle to drive the development of the observation tool. So if the focus is on the observer's activity, this is always considered in the exercise situation and toward it enhancing.

2.2 Interview methodology and analysis

Following an anthropo-technological perspective such as that proposed by Poizat et al. (2016), the research carried out is intended to be cooperative and not only applicative. Thus, the first study, presented here, consisted of meetings with the organisers of crisis exercises of local major risk prevention and civil security departments. The construction of the data was based on an interview method inspired by comprehensive interviews (Kaufmann, 2016) while incorporating the situational character of the ordinary activity of the exercise organisers in accordance with the ontological principles of the 'action course' program (Poizat et al., 2016). The interviews had three aims: first, to mobilize exercise organisers, then to take the ordinary constraints of the work, finally, to build on existing actual practices.

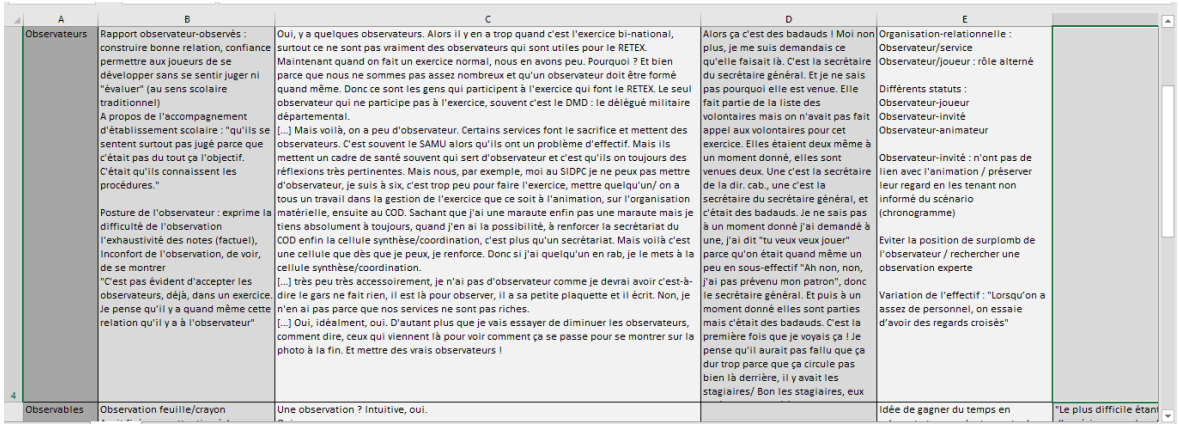
Table 1: Four interviews

Interview 1	Interview 2	Interview 3	Interview 4
Head of Prevention and Major Risks City of about 40000 inhabitants	Exercise organiser Interdepartmental Civil Defence and Protection Department Occitanie Region	Head of Interdepartmental Civil Defence and Protection Department Occitanie Region	Exercise organiser Interdepartmental Civil Defence and Protection Department Occitanie Region
Interview in face to face	Interviews in face to face	Videoconference	Videoconference
Date 31-05-2021	Date 03-06-2021 and 21-06-2021	Date 29-06-2021	Date 20-07-2021

Duration: 83 minutes	First not recorded; Second, duration: 47 minutes	Duration: 81 minutes	Not recorded; notes-taking in real time by two researchers (13 pages word)	

Each recorded interview was transcribed. Interview notes and note taking were then classified according to emerging categories: work constraints, observer posture (Figure 1), observer-observed relationship, observable, observation tools. This allows a view of all interviews at the same time according to a common category.

Figure 1: Extract from the results analysis table



	A	B	C	D	E	
	Observateurs	Rapport observateur-observés : construire bonne relation, confiance permettre aux joueurs de se développer sans se sentir juger ni "évaluer" (au sens scolaire traditionnel) A propos de l'accompagnement d'établissement scolaire : "qu'ils se sentent surtout pas jugé parce que c'était pas du tout ça l'objectif. C'était qu'ils connaissent les procédures." Posture de l'observateur : exprime la difficulté de l'observation l'exhaustivité des notes (factuel), Inconfort de l'observation, de voir, de se montrer "C'est pas évident d'accepter les observateurs, déjà, dans un exercice. Je pense qu'il y a quand même cette relation qu'il y a à l'observateur"	Oui, y a quelques observateurs. Alors il y en a trop quand c'est l'exercice bi-national, surtout ce ne sont pas vraiment des observateurs qui sont utiles pour le RETEX. Maintenant quand on fait un exercice normal, nous en avons peu. Pourquoi ? Et bien parce que nous ne sommes pas assez nombreux et qu'un observateur doit être formé quand même. Donc ce sont les gens qui participent à l'exercice qui font le RETEX. Le seul observateur qui ne participe pas à l'exercice, souvent c'est le DMD : le délégué militaire départemental. [...] Mais voilà, on a peu d'observateur. Certains services font le sacrifice et mettent des observateurs. C'est souvent le SAMU alors qu'ils ont un problème d'effectif. Mais ils mettent un cadre de santé souvent qui sert d'observateur et c'est qu'ils on toujours des réflexions très pertinentes. Mais nous, par exemple, moi au SIDPC je ne peux pas mettre d'observateur, je suis à six, c'est trop peu pour faire l'exercice, mettre quelqu'un/ on a tous un travail dans la gestion de l'exercice que ce soit à l'animation, sur l'organisation matérielle, ensuite au COD. Sachant que j'ai une maraute enfin pas une maraute mais je tiens absolument à toujours, quand j'en ai la possibilité, à renforcer la secrétariat du COD enfin la cellule synthèse/coordination, c'est plus qu'un secrétariat. Mais voilà c'est une cellule que dès que je peux, je renforce. Donc si j'ai quelqu'un en rab, je le mets à la cellule synthèse/coordination. [...] très peu très accessoirement, je n'ai pas d'observateur comme je devrai avoir c'est-à-dire le gars ne fait rien, il est là pour observer, il a sa petite plaquette et il écrit. Non, je n'en ai pas parce que nos services ne sont pas riches. [...] Oui, idéalment, oui. D'autant plus que je vais essayer de diminuer les observateurs, comment dire, ceux qui viennent là pour voir comment ça se passe pour se montrer sur la photo à la fin. Et mettre des vrais observateurs !	Alors ça c'est des badauds ! Moi non plus, je me suis demandais ce qu'elle faisait là. C'est la secrétaire du secrétaire général. Et je ne sais pas pourquoi elle est venue. Elle fait partie de la liste des volontaires mais on n'avait pas fait appel aux volontaires pour cet exercice. Elles étaient deux même à un moment donné, elles sont venues deux. Une c'est la secrétaire de la dir. cab., une c'est la secrétaire du secrétaire général, et c'était des badauds. Je ne sais pas à un moment donné j'ai demandé à une, j'ai dit "tu veux veux jouer" parce qu'on était quand même un peu en sous-effectif "Ah non, non, j'ai pas prévenu mon patron", donc le secrétaire général. Et puis à un moment donné elles sont parties mais c'était des badauds. C'est la première fois que je voyais ça ! Je pense qu'il aurait pas fallu que ça dur trop parce que ça circule pas bien là derrière, il y avait les stagiaires/ Bon les stagiaires, eux	Organisation-relationnelle : Observateur/service Observateur/joueur : rôle alterné Différents statuts : Observateur-joueur Observateur-invité Observateur-animateur Observateur-invité : n'ont pas de lien avec l'animation / préserver leur regard en les tenant non informé du scénario (chronogramme) Eviter la position de surplomb de l'observateur / rechercher une observation experte Variation de l'effectif : "Lorsqu'on a assez de personnel, on essaie d'avoir des regards croisés"	
4	Observables	Observation feuille/crayon	Une observation ? Intuitive, oui.		Idée de gagner du temps en	"Le plus difficile étant

The results were based on these categories. The analysis was performed manually by a researcher. The results were compared with the eyes of the CRIZ'INNOV research team and the participants of the interviews.

3. Results

These interviews allowed us to better understand the needs and constraints of the end users of the observation tool in their daily work. These elements are important to build a tool adapted to their expectations and thus facilitate its appropriation and use.

3.1 Towards an user-friendly and scalable tool

The analysis of the interviews reveals two ordinary constraints experienced and evoked by the managers of the exercises of local authorities and public departments: the multiplicity of the missions of their department and the difficult mobilization of the teams for the exercises. These two constraints are related to time management and human resource management concerns. They also show a need for continuous training for the organization of the exercises as a whole and for observation of exercises in particular.

Having to deal with the multiplicity of missions of the department is a constraint mentioned during the four interviews with the organisers of crisis management exercises. This aspect of the job describes a work environment constrained by urgency and time constraints. This has an impact on the the time spent for the preparation and implementation of exercises. One interviewee estimated that 1/5 of the time is spent on crisis exercises. The remaining 4/5 being devoted to the other missions of the Prevention and Major Risk department of this municipality of almost 40,000 inhabitants. Another interviewee explained that the other tasks of the department add up when they spend time organising and carrying out the exercises. This means that these other tasks will have to be done later. There are also times when the exercise is no longer a priority due to unforeseen events that need to be dealt with urgently. These testimonies of the interviewees are corroborated by the observation of the researcher during her intervention in these depatments. For example, during an exercise, an unforeseen event took over an exercise forcing one of the exercise organisers to manage the event and temporarily withdraw from the organisation of the exercise. Thus, the unexpected and the emergency characterize the departments and constrain the organisation of exercises.

Another constraint mentioned in the four interviews with crisis management exercise organisers was the amount of human resources needed to carry out the exercise. The difficulty in mobilizing teams affects the priority of allocating human resources to the roles of players and facilitators. This constraint impacts the observation by relegating it to the background or even abandoning it. The allocation of human resources to observation is then seen as a deprivation: “Some services make the sacrifice and put observers” says one of interviewees. Another stressed that it is difficult to gather all the people needed for the exercises. These exercise organisers also

express regret at having to abandon certain aspects of exercises such as observation: “I don’t have an observer like I should have, […] [who] is there to observe, […] [who] has his little booklet and he writes”. At the same time, they indicate the interest to set up observers: the benefit an external point of view or the added value of the crossed-views.
Following this initial analysis of the interviews on the service’s work constraints, two ergonomic components should be considered in the design of the observation tool:

- Offer a tool that is easy to use and can be used without special training
- Provide a scalable tool for both basic and in-depth observation

The interviews also made it possible to highlight the practices used when observation is possible as well as the obstacles and difficulties encountered when carrying out the observation.

3.2 Towards a shared culture of observation

Questions oriented towards the practice of observation reveal a type of observation qualified as intuitive. Observers report comfort and discomfort areas in their usual exercise observation activity.
Crisis exercise organizers speaking about their observation practices all referred to an intuitive form of observation. This type of practice is “hands-on learning” based on personal experience in crisis management and exercises. One of the interviewees retrospectively analyses the development of his observation skills: “my observation when I started was totally different from the one I did when I finished”. The interviewee continued his speech by highlighting the fundamental role of the observer’s experience. The practice of observation and knowledge built on crisis management transforms the activity of the observer. Another interviewee talks about empirical observation based on their experience and what they know how to do. He adds that “it is without technique”.
In the practices mentioned by the interviewees note-taking is done in real time and is based on the observer’s experience. His experience in crisis management and his participation in crisis exercises allow him to implicitly identify the different observation criteria that he considers important with regard to the exercise’s objectives. Two different ways of taking notes are described by people: either a note-taking of time-stamped events, or a note-taking of the thematic categories identified at the time of observation. For observers, the interest of the first approach is the search for factual precision; the interest of the second one is to obtain a synthetic overview of the crisis unit and its actions.
Furthermore, interviewees expressed areas of comfort and discomfort in their experiences of crisis exercise observation. These areas of comfort and discomfort are characterized by: occupied posture (observer or observed), the relationship between observer and observed, the identification and interpretation of elements to be observed (Table 2).

Table 2: Areas of comfort and discomfort expressed by interviewed observers

Areas of comfort	Areas of discomfort
• Identify factual and technical observables: -“It is easy to observe something very factual, the phone call was made at such and such a time” - “I note the physical organization. This is most obvious. (…) material organization, knowledge of each person’s role and (…) knowledge of the contingency plan”	• Search for completeness in the note-taking • Posture of seeing others and being seen to be recording observations (posture associated with the idea of spying or controlling) • Hierarchical positioning (associated with an unwanted overhang position) • Difficulty in observing behaviours

The analysis of this result on the practice of observation reveals a solitary and isolated form of observation activity. It therefore seems necessary to develop the culture of crisis exercises by sharing observation experiences within a community. Following the identification of this second category of analysis, two aspects emerge that need be taken into account in the development of observation through an observation tool:

- To design a tool that that opens up possible spaces and allows the sharing of observation experiences
- To develop an observation tool and methodology for sharing didactic and pedagogical knowledge on crisis observation

4. Conclusions

The results put forward are the consideration of the daily work and constraints of the field actors, the practice of an intuitive observation and the development of a working community consisting of exercise organizers, crisis manager, engineers and researchers. These results allow discussion of the observation methods already existing in the scientific literature and based on technical and non-technical skills grids. This discussion contributes to the creation of a set of requirements for the crisis exercise observation tool. Linking the scientific literature with the experiences of the field actors helps to guide both the existing and relevant resources to be retained as well as their transformation for co-development of an appropriate tool by exercise organizers and crisis managers.

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