DEVELOPING NON-TECHNICAL SKILLS

Non-technical skills training is one aspect of Human Factors in operations that has become an important part of developing competency and expertise in aviation. It helps to focus on aspects of operational work that help to create safety, but that we often don't pay much attention to. In this article, **Florence-Marie Jégoux** reflects on her time as a Human Factors trainer, and explains what she has learned along the way.

KEY POINTS

- **We cannot train experts and teach non-technical skills in a traditional way.**
- **Non-technical knowledge needs to be instilled into non-technical skills.**
- **Creative teaching methods may help, especially facilitation, like in team resource management.**
- **Ultimately, Resource Management must spread through and between organisations.**

How can we develop non-technical skills among operational staff? What helps and what hinders? In this article, I reflect on my practical experience as a Human Factors trainer and specialist, and share the lessons that I have learned in almost 10 years of practice.

Lesson 1: We cannot train professionals the way we teach students

Teaching HF in a lecture from a 'know-it-all' position results in resistance: "Yes, but… It's not possible the way we work", "we can't do that because…" HF 'lectures' may be counter-productive: "You want to tell me how I am supposed to work?" Resistance needs to be addressed by encouraging free speech. Protests and disagreements should be expressed instead of being kept politely silent.

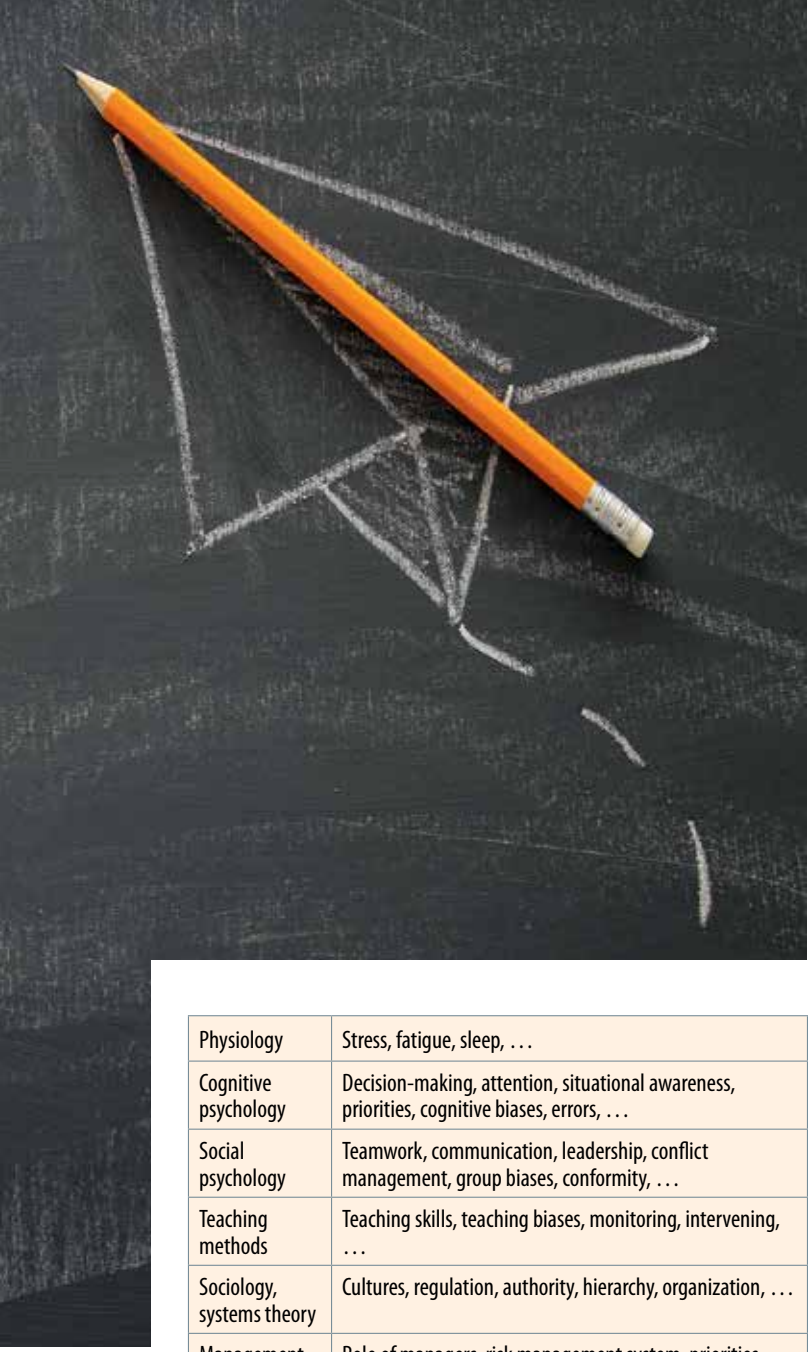
Trainers get resistance when they put the professional expertise of operational experts at stake. The participants can feel like they are being re-assessed or infantilised. They are experts, and their expertise first needs to be recognised.

Lesson 2: We have to be realistic about what can be achieved by CRM/TRM training

Technical competencies are the high level competencies that have been traditionally taught to professionals. Non-technical skills are more linked to our personality, our emotional intelligence, our values, our behavioural patterns, and our professional identity.

When developing non-technical skills, two pitfalls should be avoided. One is a mindset that, "we can change every attitude". This may provoke clashes during a CRM/TRM session. It may bring about disillusionment. The other pitfall is its contrary: "we cannot change anything or anyone". We often hear, "that's the human factor, we can't do anything about that. We can't change people". The aim is not about changing people. It is about helping them to get insight and change working behaviour.

A good incentive is the collective opinion: when a growing number of people change their behaviour, at some point ▸▸



Physiology	Stress, fatigue, sleep, …
Cognitive psychology	Decision-making, attention, situational awareness, priorities, cognitive biases, errors, …
Social psychology	Teamwork, communication, leadership, conflict management, group biases, conformity, …
Teaching methods	Teaching skills, teaching biases, monitoring, intervening, …
Sociology, systems theory	Cultures, regulation, authority, hierarchy, organization, …
Management	Role of managers, risk management system, priorities, …
Safety culture	Experience report, experience sharing, …
Selection and training	Selection, initial, recurrent, continuous training, examinations, …

Table 1: Non-technical factors: A non-exhaustive list

they reach a critical mass. This turning point can lead the remaining individuals to changing their behaviour, too. For instance, when many newcomers arrive in a control centre or tower, sooner or later, they change some habits to fit into the team (going to the restaurant with colleagues, using new working methods, etc).

For safety behaviours, we often need forerunners. Forerunners may sometimes be the trainers themselves. They may be the best ambassadors. By implementing non-technical skills into their daily operational practices, they inspire their peers. The best lessons may come not from the classroom, but from behaviour at work generally.

Lesson 3: HF knowledge is not enough

Knowledge and skills are different. If HF knowledge were sufficient, CRM or TRM trainers or experts would have excellent decision-making and communication. As we are also human, we sometimes make mistakes and do not communicate effectively. A lack of coherence between what is said and what is seen in training sessions and in our daily behaviour can decrease credibility and legitimacy. Therefore, the selection and training of trainers is critical.

Turning knowledge into competencies is not easy. Take sleep, for instance. Many doctors have detailed knowledge about sleep and good 'sleep hygiene'. Yet their initial training and work conditions do not help them to transfer this knowledge into their own practice.

In order to turn knowledge into skills, we need some creative learning methods to overcome the mental blocks that may arise.

Lesson 4: Creative teaching methods are needed

Different kinds of methods may be used to develop NTS. But creative methods are needed to improve our understanding about our thinking, our ability to learn from experience, and our capacity to adapt to unknown situations. TRM training requires several active learning methods: case studies, short videos, games, role-playing games, simulation, etc. Their aim is not about having fun (although recent studies made it clear that fun fosters memorising), but rather bringing about insights and debate. Then, the facilitator's role is to enable participants to transpose what they experience in the activity to the ops room by asking specific questions, like:

- What were the problems?
- How did you solve them?
- How can it be used in daily work?

Seeing different situations from different perspectives is therefore a way to enhance their capacity to produce new solutions to recurrent problems. From a Safety-II perspective, "understand how things usually go right" (EUROCONTROL, 2013) is as essential as identifying what goes wrong (and indeed is "a basis for explaining how things occasionally go wrong" (p. 21). Understanding what works also helps to improve motivation and quality of work life.

With fighter pilots, mindfulness has also been shown to be useful in dealing with unforeseen events. Mindfulness may be seen as the capacity not to judge a situation according to our positive or negative feelings. The French Army Biomedical Research Institute explored the problem solving skills of Mirage 2000 pilots (from failure simulations). It was found that performance was linked to mindfulness and openness (or curiosity), although the number of years of professional experience was of no help (Dechy et al, 2016).

Lesson 5: Give food for thought, not 'the right answers'

In using creative methods, there is an essential point about 'posture'. Instead of trying to convey 'the right answer' (which probably makes them wrong…and who likes that?), or delivering moralistic messages, we need to debate with openness and just give experts food for thought. Sometimes there are no 'right answers'. Sometimes they do not see the point during a course but perhaps, a few weeks later, they will think it over and change their point of view. It requires trainers' humility and trust in the process.

We all know that we make mistakes, but experiencing them for ourselves can help us to stop feeling ashamed of making mistakes. It also helps to have a briefing that normalises the fact that we all make mistakes (see Moneypenny, 2017), along with a sensitive and funny debriefing.

Lesson 6: Facilitation and debate is critical for skill learning

Facilitation is a method to encourage debates and reflective activities, which enables people to get understanding and perspective, and transpose what is seen in training into daily life. It is a method that puts ideas to the 'reality test' regarding:

- professionals and their own practice: we can become aware of the pros and cons of our practice
- professionals and their peers: different opinions cross-fertilise and enable field experts to complete their own toolbox with their colleagues' tools and tricks
- individuals/teams and their taboos: they may look at implicit rules and taboos, question them and create a space for discussion
- facilitators and professionals to HF theories and knowledge: are these theories realistic? What can be put into practice?

For instance, CRM and TRM include many debates on professional issues. TRM is a program that enables "operational questions, doubts and uncertainties to surface and receive appropriate attention before they become an irreversible situation" (Bunjevac, 2011). This experience sharing among experts is a key to improve non-technical skills.

Lesson 7: Ultimately, resource management must spread through the organisation

These methods are very useful but they usually affect only operational personnel. Others at the upper levels of organisations also have competencies and may develop or inhibit them. The decision-making process occurs over a longer time frame, and is scattered across multiple departments and individuals. The feedback from their errors also occurs over a much longer timeframe, sometimes in years – if at all. But is there any specific reporting for organisational lessons learned, as there is for operational staff? Or is this rather informal?

In some airlines, Crew Resource Management became Company Resource Management, with people from different departments attending the CRM courses, instead of working in silos. But also looking outside of the organisation, we may work on two axes:

- **a horizontal axis:** with different operational jobs and activities that are related: Operational Resource Management.
- **a vertical axis:** with different hierarchy levels, both bottom up and top down: Organisational Resource Management.

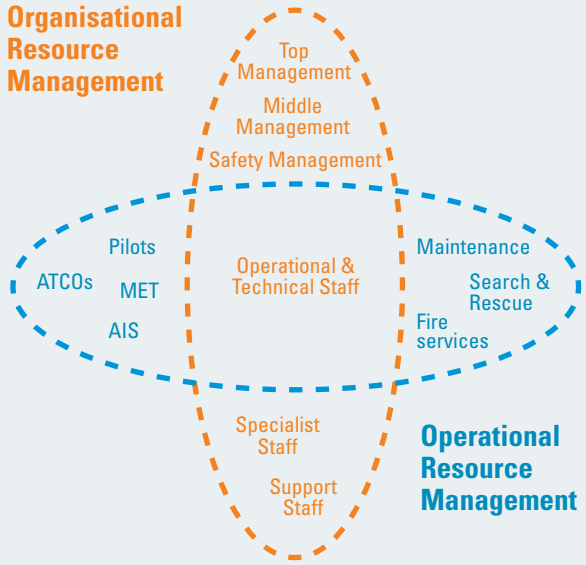


Figure 1: Operational and Organisational Resource Management

Paying attention to these two axes will help to ensure that resource management is for the many, and not just the few.

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