

 European Commission, Horizon 2020

# Didactical Guidelines

## Is there variation and differentiation?



*TARGET GROUP: police training coordinators & trainers*

*WHAT TO EXPECT: Good practices for variation and differentiation*

*SOURCES: based on empirical and experiential findings of the research studies and field trials of the SHOTPROS project*

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## Is there variation and differentiation?

Variation refers to the variability in a training environment or task (often from practice trial to practice trial) *without* making it harder or easier. Variation allows the learner to explore various movement solutions for achieving a goal. Differentiation refers to the variability in a training environment or task *with* the intent to make it easier or harder. Differentiation allows the trainer to adapt the training environment to the group level or to accommodate learning for trainees with varying levels of skill. Including variation and differentiation into a training environment has been shown to enhance exploration, skill acquisition, and transfer of learning (Wulf & Schmidt, 1997; Newell & McDonald, 1992).



[tinyurl.com/bdhi2jys](https://tinyurl.com/bdhi2jys)

For relevant information on how to apply the didactical concept of variation and differentiation in VR, watch this information video by scanning the QR code or clicking the link.

## Good practices for variation and differentiation

- The trainer ensures that they have a predetermined selection database of VR environments (e.g. a minimum of three different virtual environments to vary easily and quickly in practice situations).
- To achieve variation and create a new practice situation, the trainer changes the context of the virtual environment for each repetition:
  - Through environmental changes: location variation (an apartment, a furniture shop, an open square, an office space, a school etc.) and additional objects in the environment, etc.
  - Through different starting points for trainees and role-players in the same virtual environment: For instance, the trainees start in the same building in one repetition at the main entrance and in the next repetition they start at the back entrance and the position of the role-player is in the first repetition in the kitchen and in the next repetition in the living room.
- To achieve differentiation, the trainer varies the level of complexity per repetition:
  - Differentiation through NPC: the trainer changes NPC level of aggression or changes their appearance, few or many perpetrators NPCs but also bystanders NPCs in the environment, NPCs with harder to interpret behaviour, more or less responsive NPCs, etc..
  - Differentiation through role-players: the trainer changes the behavioural instruction of the role-players, changes their appearance by giving them a different VR skin (appearance), changes the speed at which they act or has the role-player carry a knife in one repetition and a machine gun in the next.

- Differentiation through manipulating objects: the trainer changes presence and appearance of weapons (weapons “hidden under a pile of clothes on a desk, behind the back of an NPC, unusual weapons like a hammer etc.), using transparent space or space with many obscured/hidden area.
- The trainer asks the role-player to adapt the course of the scenario on the fly to take advantage of the opportunity to not be visible or audible to trainees as a trainer. Because the trainers’ instructions to the role-player are invisible and inaudible to the trainees even during the scenario, trainers have the freedom to adjust role-player behaviours to their liking (e.g., having the role-player cursing at the trainee). Adjusting role-player behaviour on the fly can be done through wireless headset/microphone communication between trainer and role-player or by physically moving or guiding the role-player to the intended position.
- The trainer creates an increasingly challenging environment for a trainee to have a positive experience and adjust the level of difficulty to the capacities and developmental phase of the trainee.
  - The trainer monitors the trainee’s success by looking at the performance indicators (e.g., DMA-specific behaviours, tactical behaviours, etc.) using the in-action monitoring feedback options that VR offers.
  - If the training seems too simple for the trainee, the trainer up-scales the level of complexity directly by activating additional stress cues or changing the context (e.g., night-time, medium to high level of threat, presence of weapons).
  - If the trainee starts to make mistakes, the trainer may want to down-scale the level of complexity for optimal learning (e.g., daytime, low to medium level of threat).