

# **From Concept to Combat Ready: Mobile VR Simulation for Training in the Danish Home Guard**

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*"We might not be the best, but we do our best."*



# Agenda

- **Danish Home guard Training School**
- **Why?**
- **What**
- **The System**
- **The Test**
- **Conclusion**
- **Lessons Learned**



# The Danish Home guard Training School

## Danish Home guard

- 43.000 volunteers (18 – 85 years of age)

## Danish Homeguard Training School

- 75 employees (10 in study/developing section)
- 200 courses each year

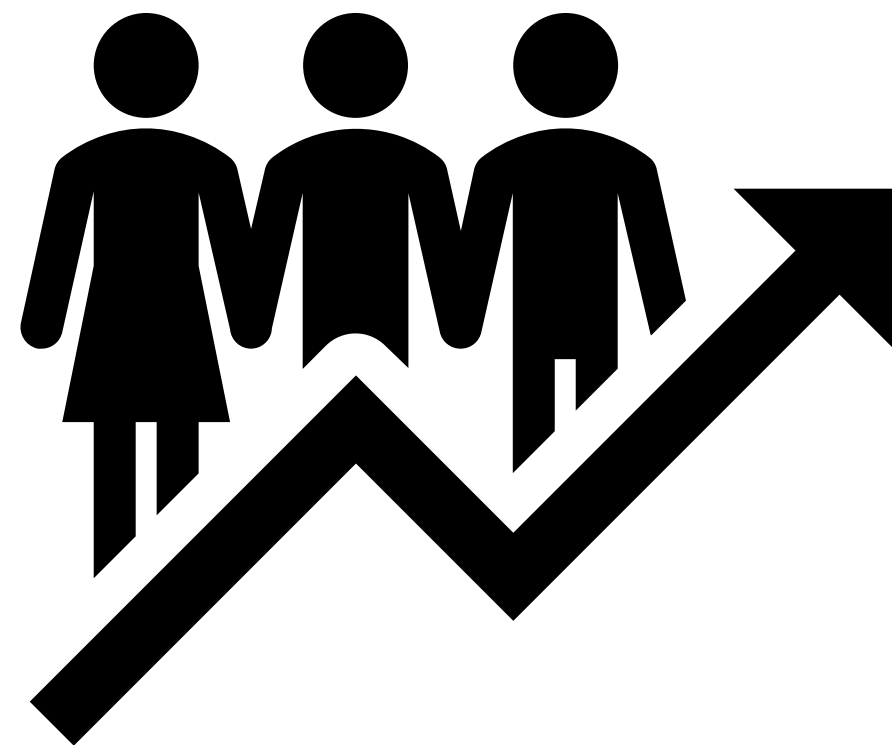
## Activity (2024)

- 13,000 trainees (5k on-site, 8k online)
- 20,000 training days (↑ from 2023)



## Why? (The Burning Platform)

- Increased intake into the Home Guard
- Need to scale training capacity
- More flexible training for volunteers
- Supplement to live firing and SITTAL
- Maintain and develop skills outside the range



## What: The idea



- Mobile shooting simulator



- Cost-effective at scale



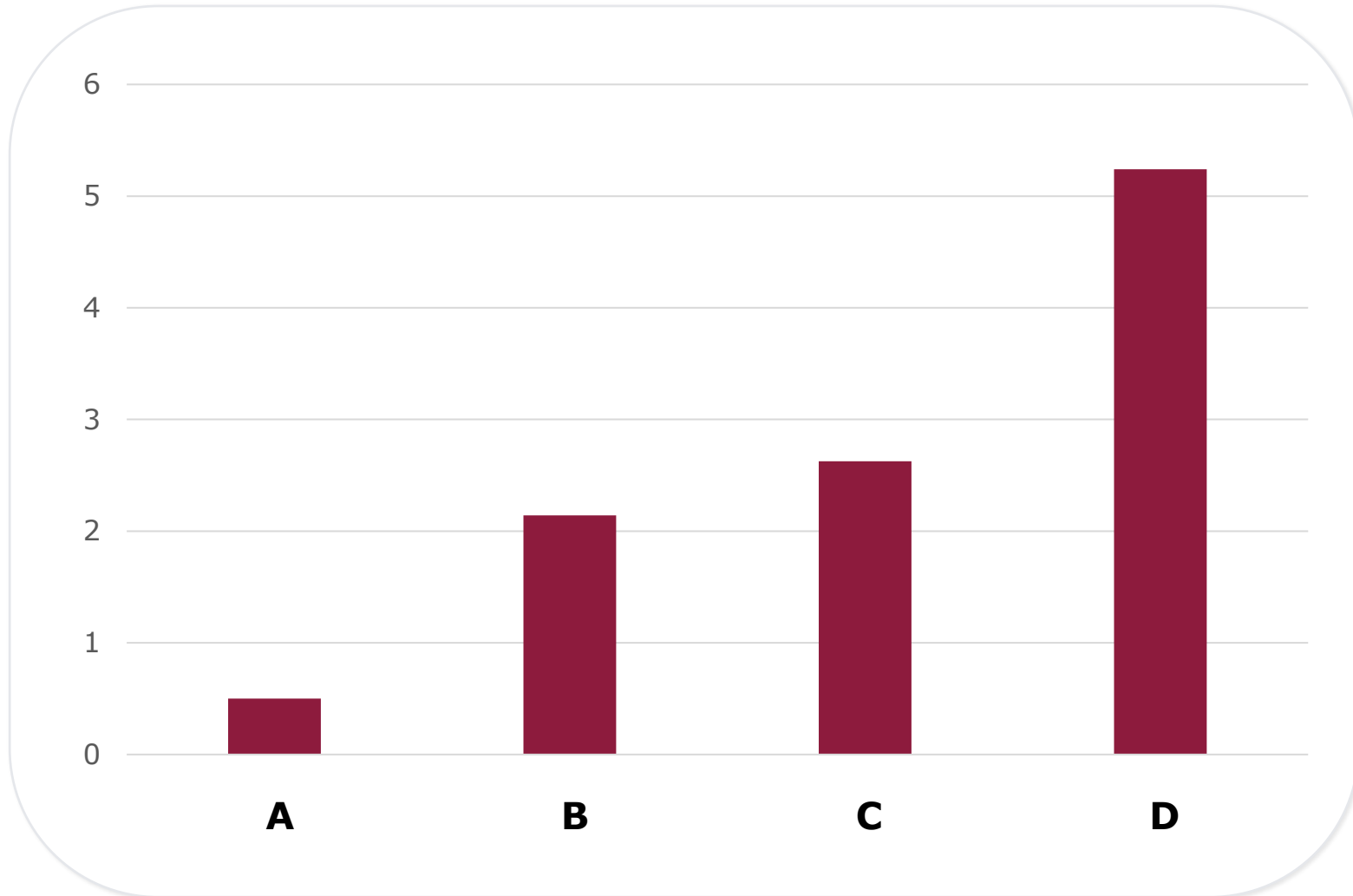
- Realistic weapons (recoil)



- Scalable to counter drones, pistols, and multiplayer scenarios

# Mini procurement

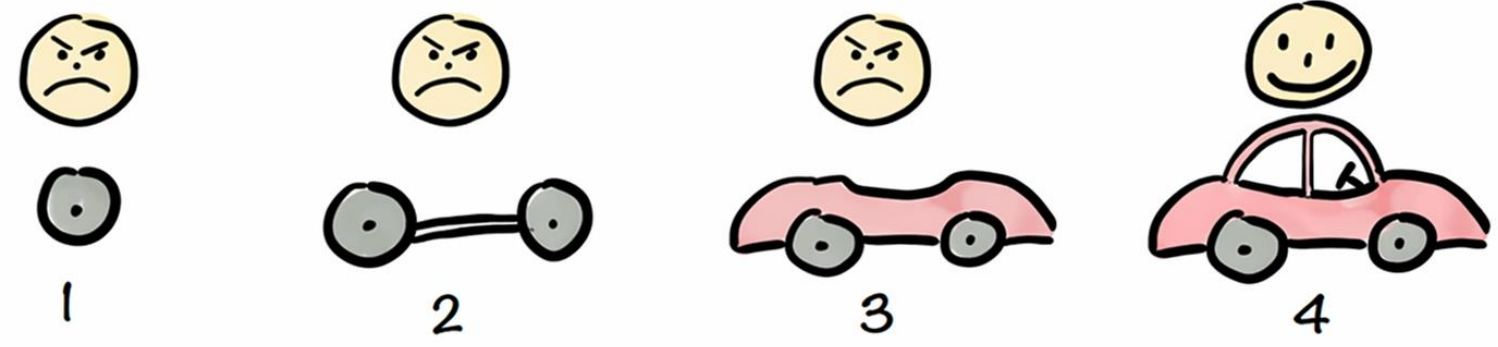
Price DKK.



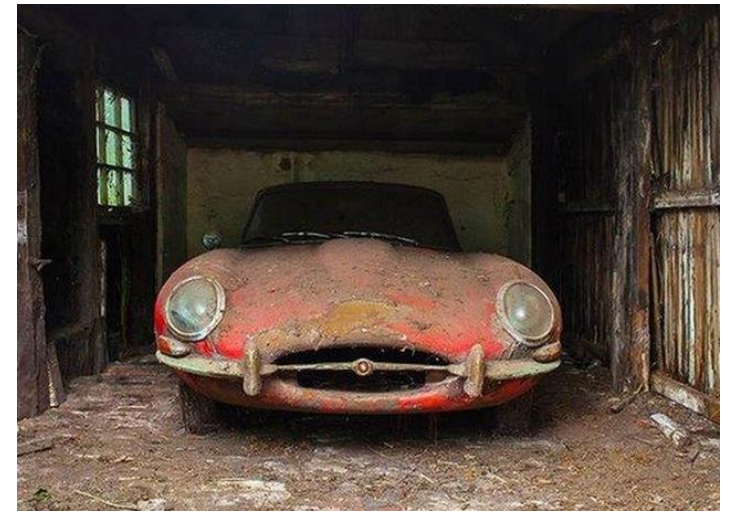
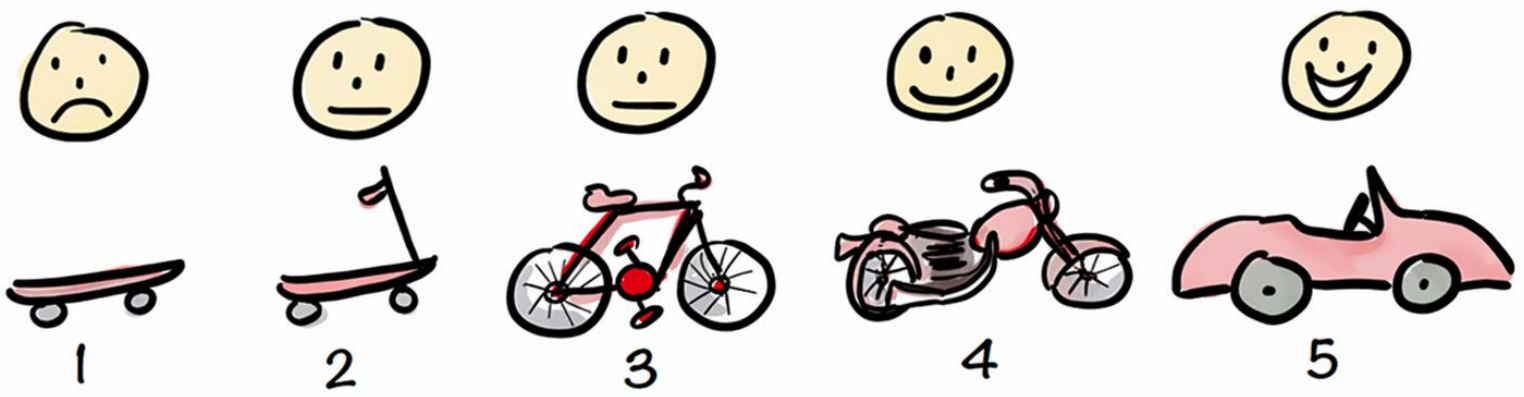
4 VR SETS



### Not like this....



### Like this!



# The System

- Meta Quest 3
- Airsoft weapon (gas) + Bluetooth



*"We knew from the beginning that realism – especially recoil – would be a challenge"*





  
**KANDA**  
DEFENCE



# The Test: VR as a Supplement to Basic Marksmanship Training

**Purpose:** Evaluate learning outcomes using VR simulation

## **Participants**

- New shooters
- Low experience

**Focus:** Shooting positions, weapon handling, safety, motivation

**Data:** Instructor observations, VKS results, user survey



# Data

- Shooter's ID number (MA no.)
- Type of shooting? (e.g. VKS, T15, etc.)
- What was the hit percentage?
- How many points did the shooter achieve? (Points on 5E target according to VKS shooting)
- How long did the shooter spend on the shooting?
- How many times did the shooter point the rifle at other shooters?
- How many times did the shooter fire outside the range's left-right boundaries?
- Was the shooting completed?
- Did the hit percentage improve compared to the previous shooting?



# Questionnaire

## Background

- Age
- Gender
- Time in the Home Guard

## Shooting Experience

- How much experience do you have with rifle shooting?
- How much experience do you have with shotgun shooting?
- How many times have you been to a shooting range in the past year?
- Have you previously completed weapon control shooting (VKS)?
- How much do you generally enjoy being at the shooting range?

## Overall Evaluation

- How satisfied are you overall with the VR shooting simulator?
- What worked well with the VR shooting simulator?
- What could be improved in the VR shooting simulator?

## Experience with VR Shooting Simulator

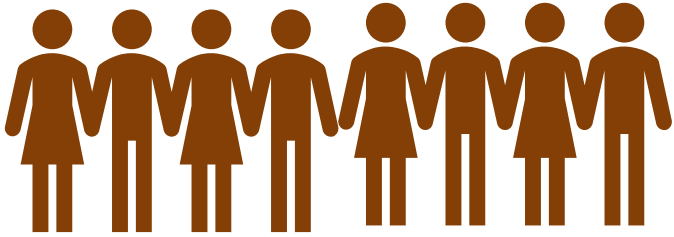
- To what extent would you like to use the VR simulator again?
- To what extent did you feel engaged during VR shooting?
- How realistic did you find the VR shooting experience?

## Perceived Learning and Effect in VR Simulator

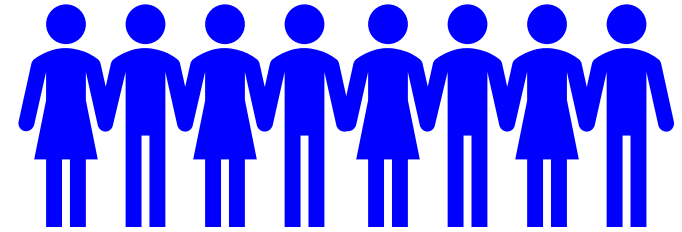
- How much time did you spend in the VR simulator?
- How many shots did you manage to fire in the VR simulator?
- To what extent do you feel prepared to go to the shooting range after using the VR simulator?
- Would you consider using VR simulation as a supplement to shooting training in the future?



**A**



**B**



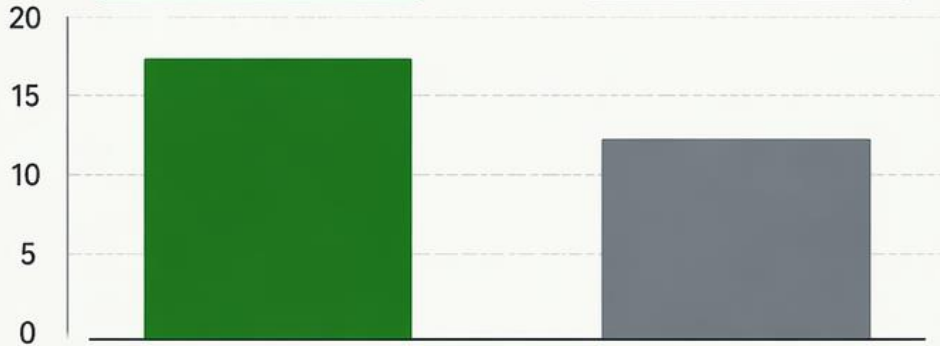
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### 1 DAY TRAINING

## IMPACT ON SHOOTING PERFORMANCE (VKS)



**+36%** VR outperformed Non-VR with 36% higher score



VR group had less live-fire time



but performed better

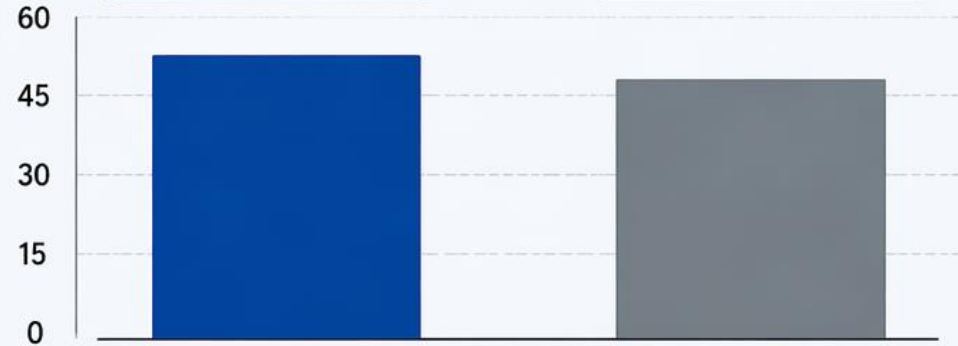
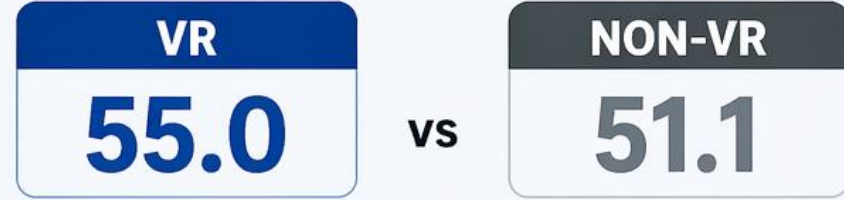


Strongest effect seen in short training scenarios



### 3 DAYS TRAINING

## IMPACT ON SHOOTING PERFORMANCE (VKS)



**+8%** VR outperformed Non-VR with 8% higher score



VR group had less live-fire time



but performed better



Strongest effect seen in short training scenarios



# LIMITATIONS & CRITICAL FINDINGS



## 1. SMALL AND BIASED SAMPLE

- Only 13 participants
- All were inexperienced and new (0–1 year)

→ Results cannot be generalized



## 2. INFLATED PERFORMANCE GAINS

- +36% improvement based on low baseline scores
- Absolute difference is small (4.5 points)

→ Risk of overstating effect



## 3. NOT A TRUE COMPARISON

- VR group received combined training (VR + live)
- Not VR vs. traditional training

→ VR effect cannot be isolated



## 4. TRAINING VOLUME BIAS

- High number of repetitions in VR
  - 85% spent 20+ min in VR
  - 77% fired 120+ shots

→ Improvement may come from more practice, not VR itself



## 5. TECHNICAL AND REALISM ISSUES

- Frequent IT problems (connection issues, system not working)
- Low perceived realism (31% “not realistic” vs. only 8% “highly realistic”)

→ Weak transfer to real-world performance



## 6. LEARNING VS. EXPERIENCE MIXED

- Many positive responses focus on:
  - “Fun”
  - “Less anxiety”
  - “Good introduction”

→ This reflects motivation and experience – not necessarily performance



## 7. PARTICIPANTS ARE NOT REPRESENTATIVE

- 46% have no rifle shooting experience
- 62% have not been to a shooting range in the past year
- 100% have never completed VKS before

→ Mainly reflects complete beginners



## 8. TIME & EXPOSURE BIAS

- VR group had up to one extra day of training (VR)
- More time and shots in VR may alone explain the better results

→ Results may reflect exposure, not the VR method



## KEY TAKEAWAY

“ VR shows potential as a **supplement** – especially for beginners – but current results are **not strong enough to prove it is superior to traditional training.** ”



MOST IMPORTANT QUESTION: Is VR **better** – or just **more training** in a short time?



# Conclusion (Mixed Success)

- **There is clear potential – but the test was not perfect**
- Data extraction must be in place from the start
- Hard to integrate mid-training without causing friction
- Test early → fail fast → learn fast

*"VR can enhance learning, boost motivation, and save resources – but the key question is not what the technology can do, but what we want to use it for, and whether a simpler or better solution exists."*



# Lessons Learned: Take home message

- **Instructor Buy-in:** Moving from "Range Master" to "Digital Coach."  
→ Ensuring trainers aren't "polluting" the test with skepticism.
- **Objective Validation:** Using external evaluators  
→ Ensure unbiased data on learning outcomes.
- **Reliability & Backups:** \* **The 10-minute rule: If tech fails,**  
→ Dry-drill procedures immediately.  
→ Offline-capable systems for field deployment.  
→ Hybrid training: VR as a station, not a single point of failure.

**Soldiers hate two things!**



**Changes and the way things are!**

# That's all

## Questions and comments?

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