



ÖSTERREICHISCHES BUNDESHEER
Theresianische Militärakademie
Institut für Offiziersausbildung

Integration of mixed reality into military training

*A didactic-technological framework for improved
situational awareness and instructor support at the
Theresan Military Academy*

MAJ SONNBERGER Matthias

EINSATZBEREIT FÜR ÖSTERREICH
BUNDESHEER.AT





ÖSTERREICHISCHES BUNDESHEER

Theresianische Militärakademie

Institut für Offiziersausbildung

Military training until now





Constraints of traditional military training



Costs



Safety



Scope



Objective performance evaluation



ÖSTERREICHISCHES BUNDESHEER

Theresianische Militärakademie

Institut für Offiziersausbildung

The solution: mixed reality



Image generated by ChatGPT 5.2



Fundamentals and characteristics of mixed reality

Interactivity

Immersion

Contextualisation

Flexibility and
adaptability

Data integration



Didactic principles and design elements in the MR context

Clear learning
objectives

Realistic
training
scenarios

Effective
interaction
options

Differentiated
feedback
mechanisms

Adaptability



Technological components and integration strategies



Selection of MR hardware and software



Integration of sensor data



Network architecture for multi-user scenarios

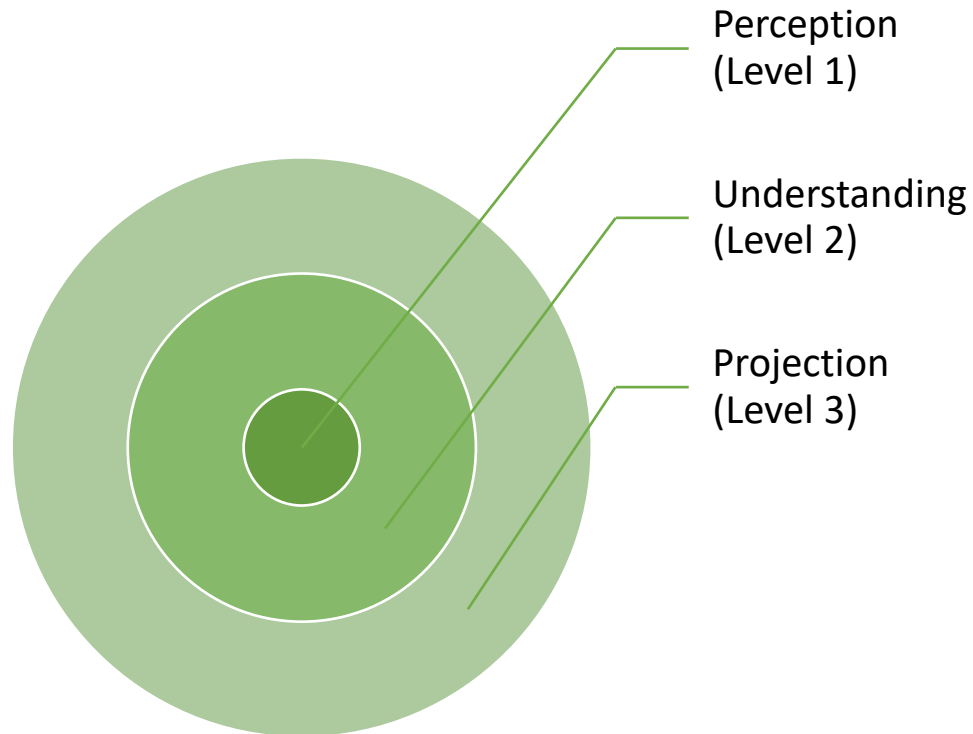


Visualisation strategies to support SA and trainers



Situational awareness and instructor support

Situational Awareness



Support for Trainers

Real-time monitoring

Automated performance analysis

Intuitive control of the training environment

Telepresence and interaction



Use cases in basic officer training

Combat training
at the rifleman to
platoon level

Leadership
training at the
company level

Basic tactical
training at the
battalion level

Tactical decision-
making training
at the battalion
level



Combat training at the rifleman to platoon level

- Promoting SA
- Communication and Leadership skills
- Decision-making under uncertainty
- Digital twins





ÖSTERREICHISCHES BUNDESHEER

Theresianische Militärakademie

Institut für Offiziersausbildung

Leadership training at the company level

- Challenge: imagination
- MR transforms verbal triggers
- Scripted scenarios
- Evaluation



Basic tactical training at the battalion level

- Increasingly complex military scenarios
- Combat scenarios that cannot be 'experienced'
- MR:
 - three-dimensional projection of the terrain,
 - blending of different terrain representation forms,
 - display of the synchronisation of elements



Tactical decision-making training at the battalion level

- Theresan Tactical Holodeck
- Immersive environment
- Process-oriented tactical problem
- Additional Stressors





Conclusion

- Overcome limitations
- Combine established didactic principles with the technological capabilities of MR
- Objective assessment and feedback
- Way ahead:
 - Stress measurement
 - Individualisation of training