



The Assessment and Generation of Evidence for XR Approaches in Training

Mayowa Olonilua (Dstl)
Samantha Black (NSC)

Eleanor Forest (BrightHF)
Petra Saskia Bayerl (CENTRIC)

Background

Study Objective

“MOD understands and leverages AR/VR/MR technologies to maximise the benefits for training and education”

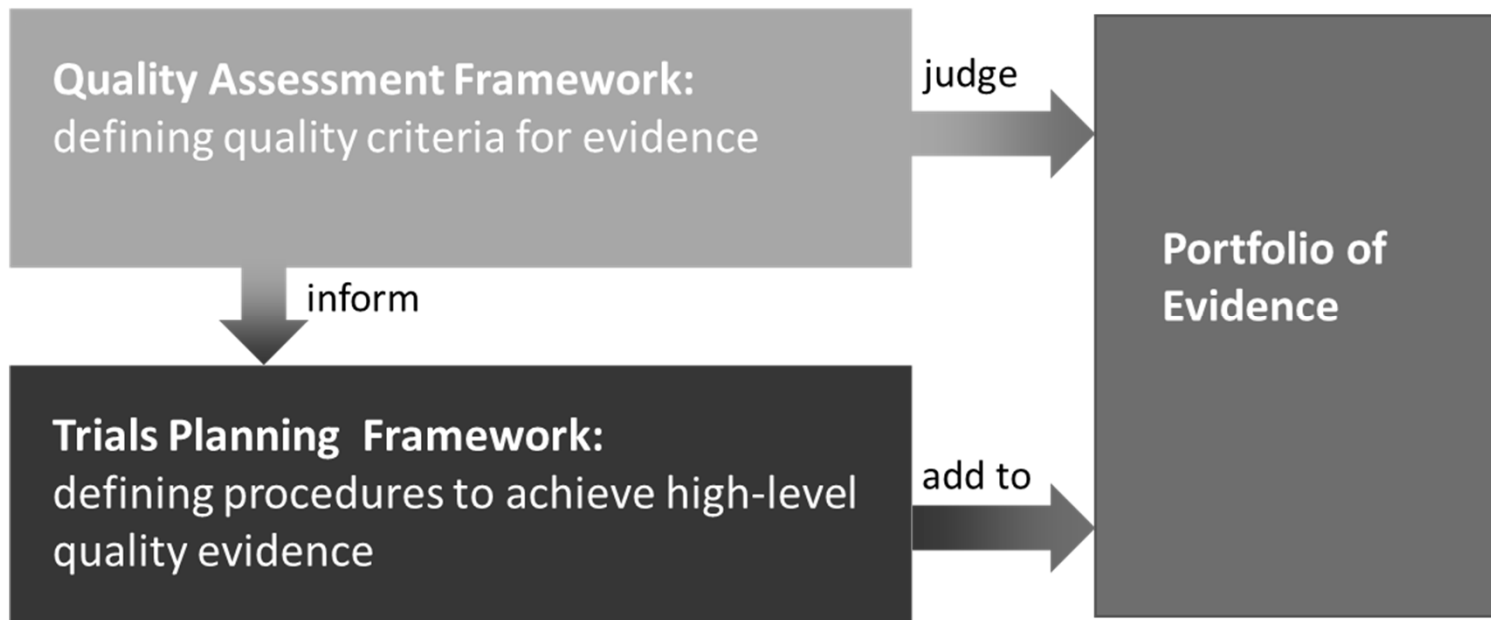


UK OFFICIAL

Question: So how are you going to provide evidence to support MOD's decisions regarding the benefits of XR technology for training and education.... For every use case.... Across all three services... in all the domains?

Answer: A framework that provides a methodology for assessing and generating quality evidence

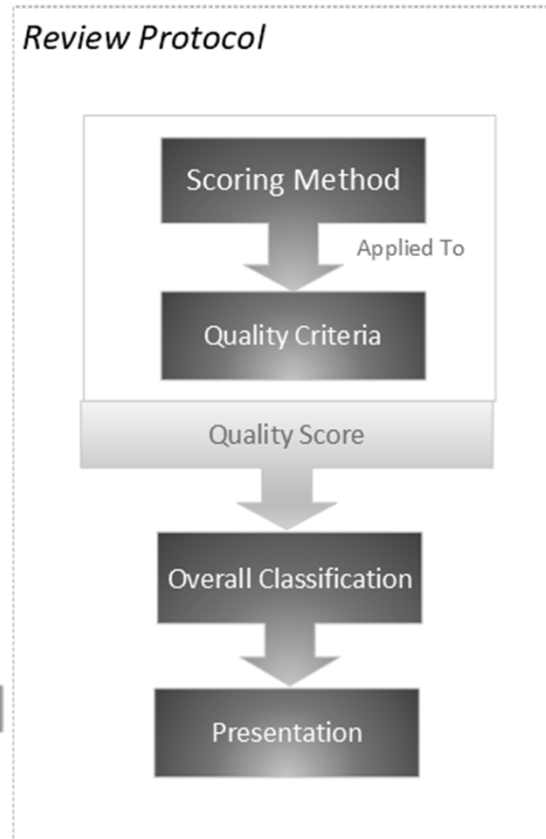
Research Method



Quality Assessment Framework

What counts as good evidence?

Research Asset:
Documented evidence of the use of XR in a T&E setting.



Assessment
Accurate? Reliable?
Relevant?



UK OFFICIAL

Quality Assessment Framework – Quality Criteria

Data Collection	Robust: Does the study use a research method well suited to the research question?
	Suitable Measures: Does what is being measured reflect what is being studied?
Analysis	Rigour: Is the analysis process transparent and well described?
Reporting	Context and purpose: Are the research aims clearly stated? Does the study acknowledge existing research or theory?
	Coherent: Is there a clear statement of the findings? Are the findings and conclusions supported by evidence? Does the author consider the study's limitations or offer alternative interpretations of the analysis?
Ranking	Scimago Journal Ranking: 0-1 score representing Quartile ranking Q1 to Q4

Quality considerations

UK OFFICIAL

Quality Assessment Framework - Scoring

		Score
Quality Criteria Groupings	Data Collection	6
	Analysis	5
	Reporting	4
	Ranking	2
	Overall Score	17
Moderate		

7-point Likert Scale

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly Agree
1	2	3	4	5	6	7

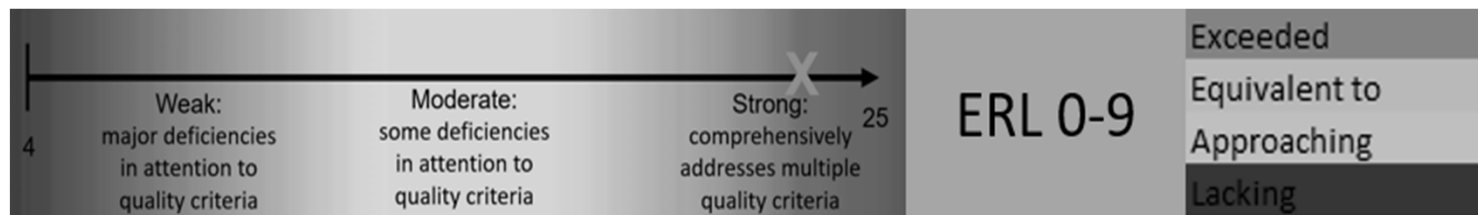
Quartile ranking (Q1 = 4, Q2 = 3 and so on)

Overall Scoring		
Strong	Comprehensively addresses multiple quality criteria	19-25
Moderate	Some deficiencies in attention to quality criteria	11-18
Weak	Major deficiencies in attention to quality criteria	4-10

UK OFFICIAL

Quality Assessment Framework - Presentation

Multi-dimensional picture of quality



Red-Amber-Green (RAG) scale for overall quality classification



drill-down

Quality rating	
	Ratings
Data	7
Analysis	6
Reporting	6
Journal ranking	4
	23

Quality rating	
	Ratings
Data	7
Analysis	2
Reporting	1
Journal ranking	4
	14

Evidence Readiness Levels



- 0 - Opinion expressed in an opinion document.
- 1 - Basic principles observed and reported.
- 2 - Concept and/or method formulated.
- 3 - Analytical and experimental critical function and/or proof-of-concept.
- 4 - Basic validation in a controlled environment.
- 5 - Experimental validation in a relevant environment.
- 6 - Experimental prototype demonstration in a relevant environment.
- 7 - Experimental prototype demonstration in an operational environment.
- 8 - Principles Concept and Method justified and qualified through Short-Term Study.
- 9 - Principles Concept and Method qualified through Longitudinal Study.

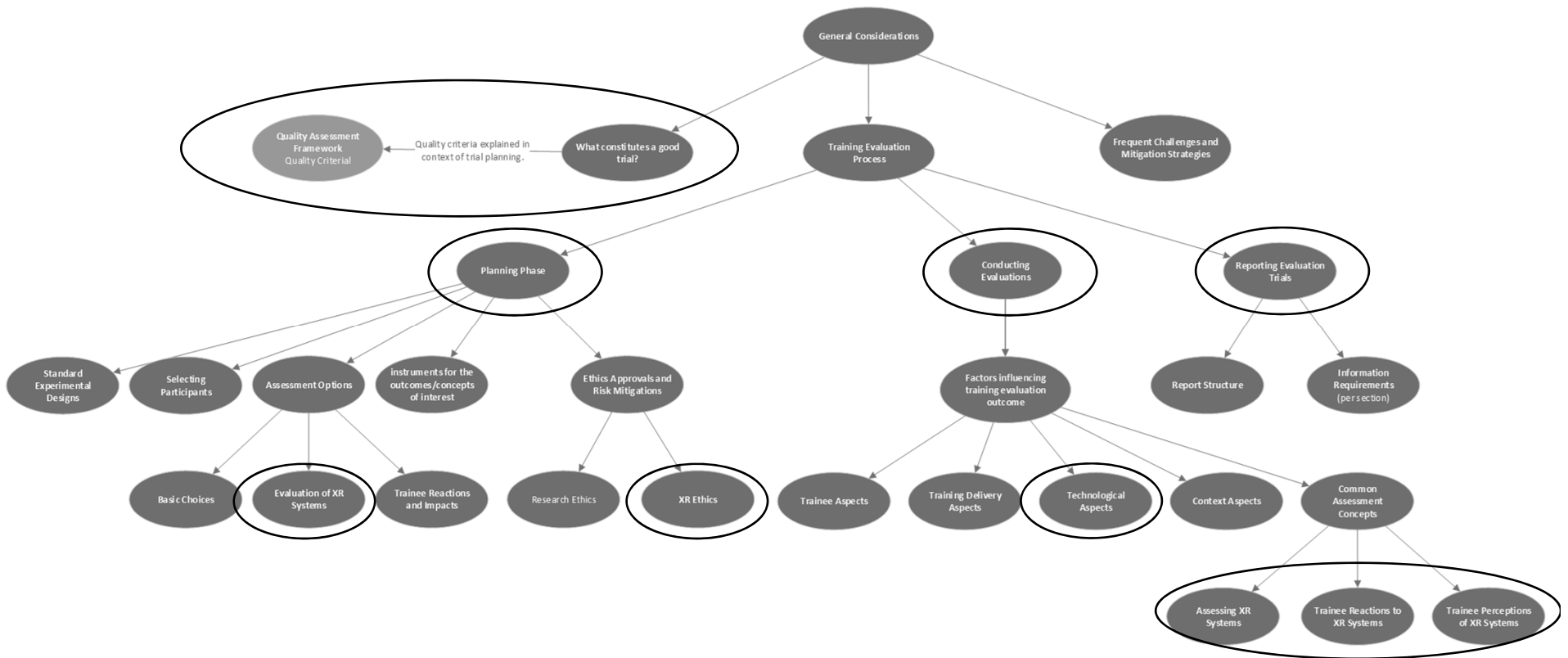
Effectiveness of the XR

UK OFFICIAL

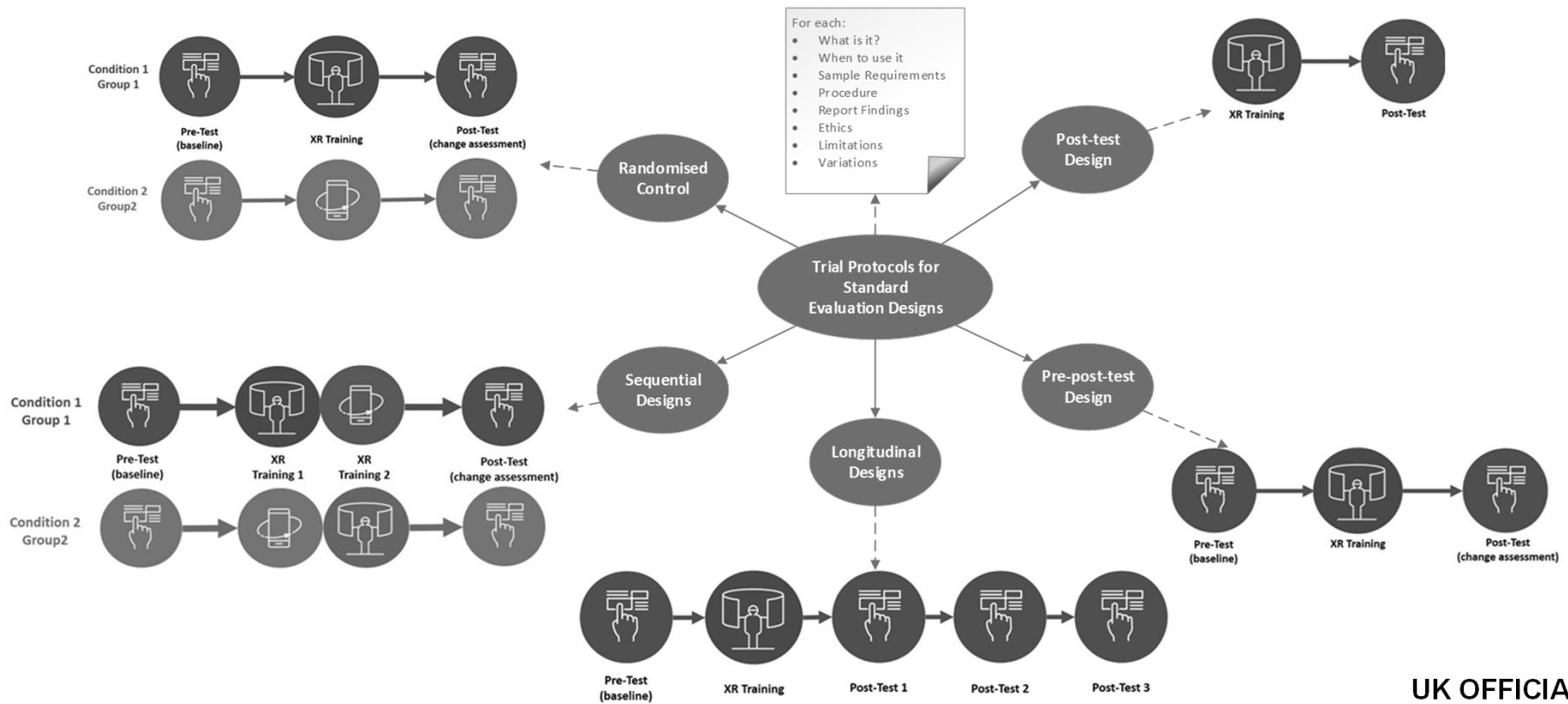
Trials Framework

- Aim: Provide decision-making support to ensure XR-based trials yield high quality results
- What is it?
 - Best practice guidance on planning, executing and reporting of XR training evaluation trials
 - Trial procedures for the most common evaluation designs
- Aimed at individuals and groups tasked with planning, conducting and evaluating trials
- Handrail, not a definitive guide

Trials Framework – General Guidance



Trials Framework – Trial Protocols



Outcomes

- What does this allow us to do:
 - Provides assurance
 - Ensures that MOD can exploit XR technology
 - Develops an intelligent customer capability within MOD

- Next Steps
 - Apply frameworks to on-going Dstl Research
 - Refine frameworks
 - Work to understand if these frameworks can provided a basis for a common XR assessment framework across NATO

[dstl] The Science Inside

Questions?

nsc 
training • simulation • consultancy

bright HF

CENTRIC
Centre of Excellence in Terrorism,
Resilience, Intelligence and
Organised Crime Research

UK OFFICIAL

[dstl] The Science Inside

Discover more



UK OFFICIAL