

Force-based Valuation of The Learning Curves for Technical Skills in Laparoscopic Training

S.F. Hardon^{1,2}, L.A. van Gastel¹, T. Horeman², F. Daams¹, D.L. van der Peet¹

(contact: s.hardon@amsterdamumc.nl)

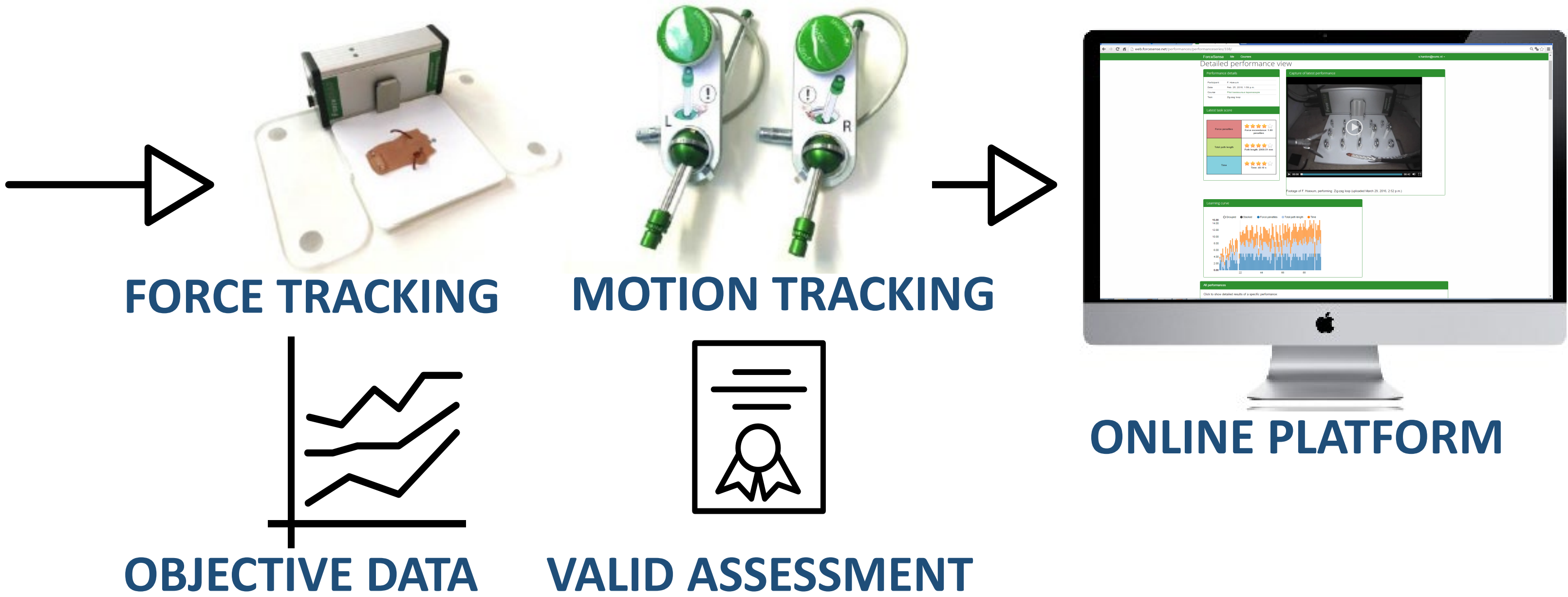
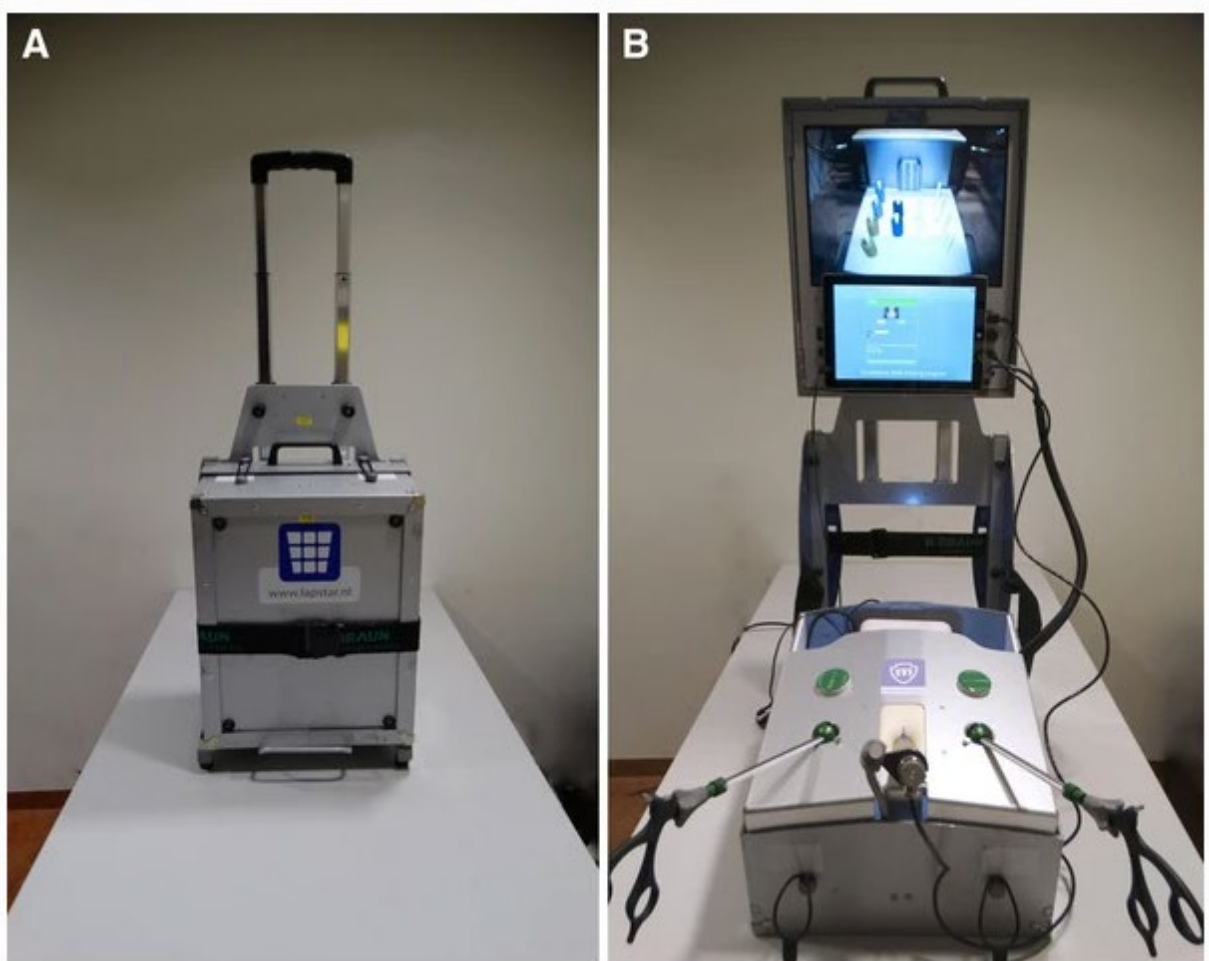
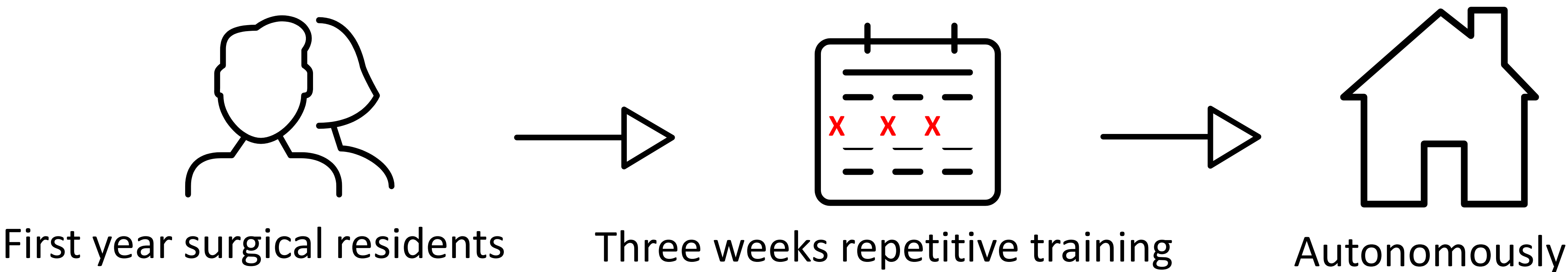
- 1. Dept. of Surgery, Amsterdam UMC, location VUmc, The Netherlands
- 2. Dept. Biomechanical Engineering, Delft University of Technology

OBJECTIVES

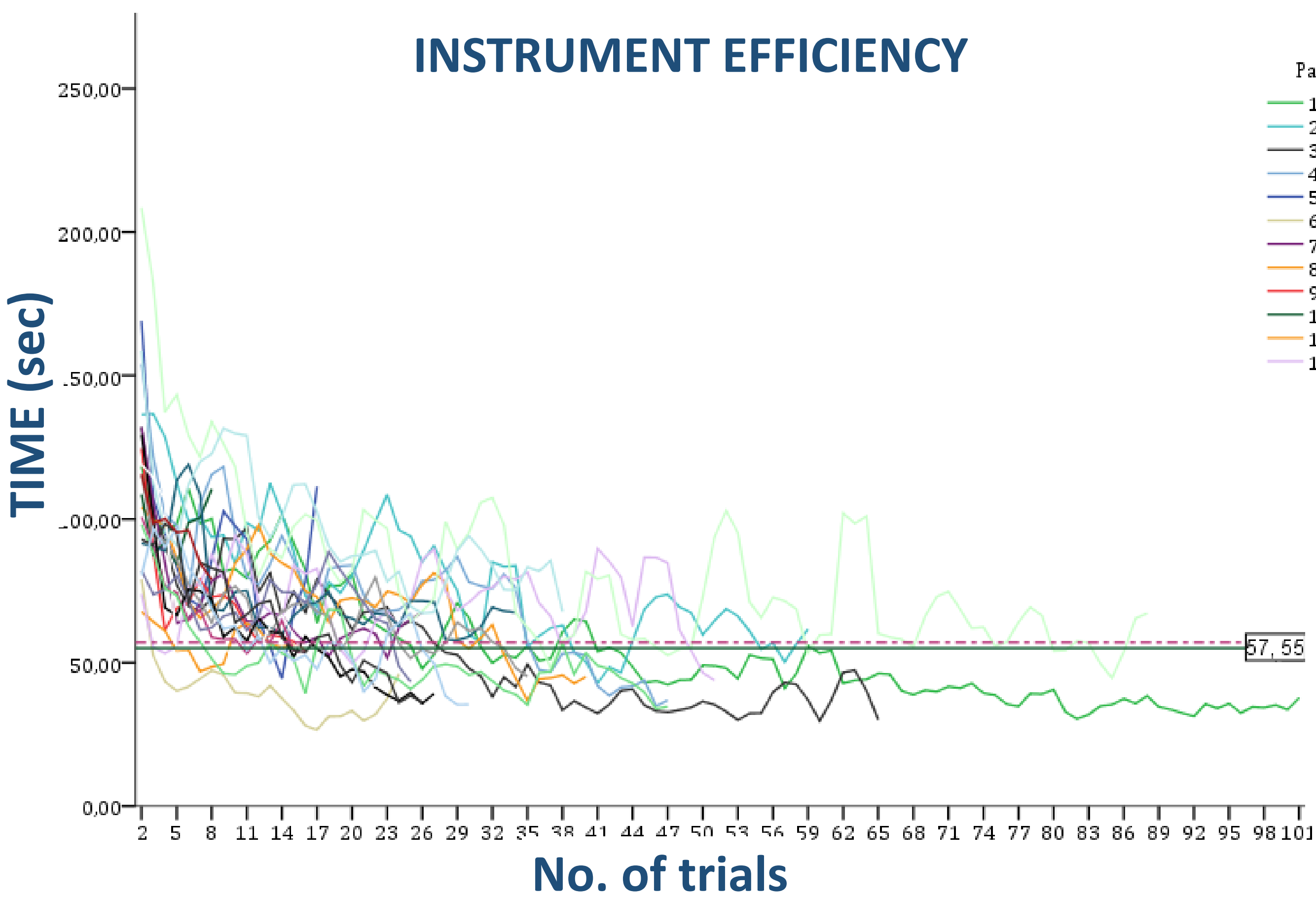
The aim of this study is to provide validity evidence for learning curve based assessment of technical skills, in a newly developed training program for minimally invasive surgery.

MATERIALS & METHODS

In this multicentre, multidisciplinary, prospective cohort study, a three-week training program for technical skills in laparoscopy was developed, validated, and implemented.



A mobile laparoscopic box trainer was equipped with six tasks for FLS and with the state-of-the-art Forcesense measurement system for objective metric-based feedback and assessment.



RESULTS

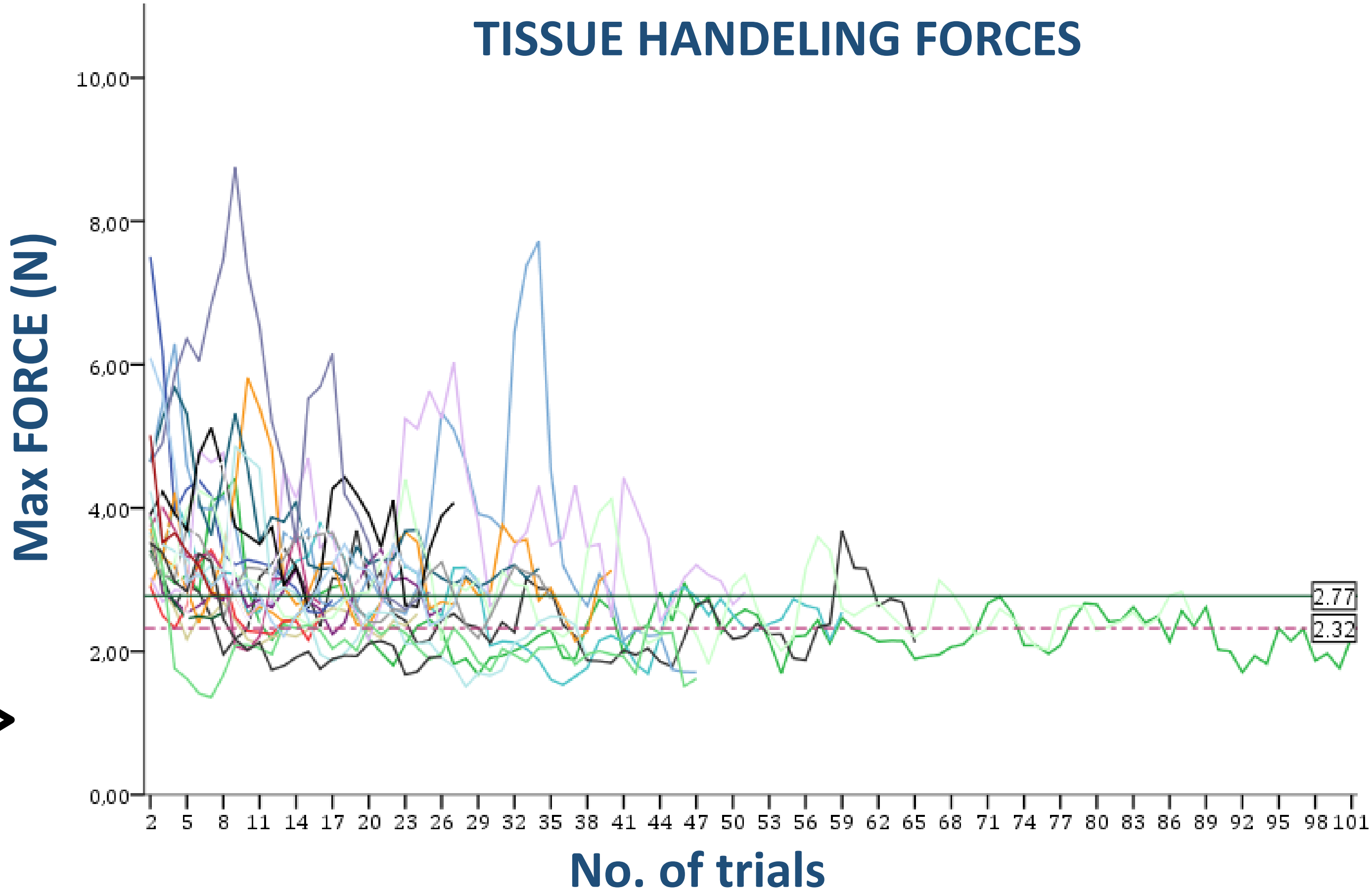
Over 4500 trials, executed by 24 residents, were included

(overall scores)	Pre-course	Post-course	Progression
FORCES (N)	2,7 ± 0,9	1,7 ± 0,5	32 %
TIME (sec)	161 ± 32	63 ± 17	61 %

Gradual/Natural improvement
Predictable curves
No feedback required

Rough curves/ Large amplitude
Unpredictable course
Specific feedback required

DISCUSSION



Force- and motion measurements allowed for objective feedback and assessment of individual learning curves. Tissue manipulation (32%) and instrument handling (61%) skills improved, both showed great variety in the gradient and predictability of the curves. We advise introduction of specific strategies for feedback and objective assessment to improve skills before entering the OR.