

The aim of this project was to create and validate a tool that would allow students to practice Ultrasound Guided Intravenous Access (USGIVA).

The project was done in collaboration with SDU, OUH, SimC and a group of medialogy students from Aalborg University (AAU). The software was produced as a spin-off on VR Ultrasound, reusing many features.

An iterative approach including usertests, group- and expert interviews was used. Development, data collection, analysis and write-up was completed in less than 3 months.

Tool efficacy was evaluated in a double blinded RCT. 19 medical students received a short session (< 60 minutes) of either e-learning (control group) or e-learning+VR practice (intervention, figure 2).

Primary outcome was no. of succesful USGIV's (maxium 3) archived on a realistic phantom in 15 minutes (figure 3). Secondary outcomes included objective measures (i.e. no. of venous punctures) as well as subjective (i.e. expert opinion on student USGIVA skill, self-efficacy).

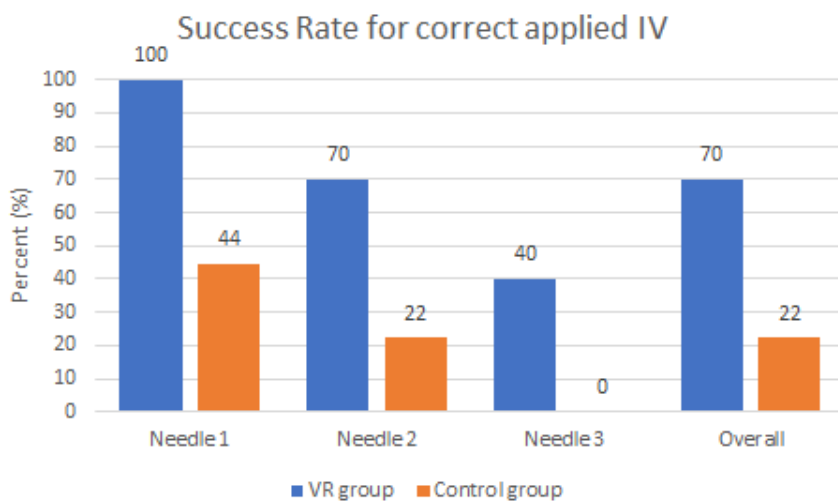
Conclusion: A positive and significant effect of the VR tool was observed.



Figure 2: Practice. A medical student from the intervention group is practicing USGIVA in virtual reality.



Figure 3: Evaluation. A medical student is trying to insert the first intravenous cannula during the OSCE based evaluation.



The graph shows the success rate of both groups over the three needles. The increase in difficulty is evident as the success rate decreases for both groups.

However, the VR group scored better across all three needles and had an overall success rate of 70% compared to 22% in the control group.

To establish if the differences in success rates were significant a Two Proportion Z-Test was used.

Statistical significance was observed individually for all three needles and total success rate.

	Needle 1		Needle 2		Needle 3		Total	
Sample size	10	9	10	9	10	9	30	27
Success	10	4	7	2	4	0	21	6
Fail	0	5	3	7	6	9	9	21
p - value (Fischer's exact)	0.0108		0.0698		0.0867		0.033	
Alpha (α)	0.05		0.05		0.05		0.05	
Significance ($p < \alpha$)	Yes		No		No		Yes	

VR Control