



## Cardio Pulmonary Resuscitation Training with Alternative Equipment: Motor Learning and Motivational Aspects.

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### Abstract

**Introduction:** Hands-on training is essential in learning cardiopulmonary resuscitation (CPR) [1]. Flemish school teachers provide CPR training, but limited resources to buy manikins restrict implementation [2]. This justifies the study of low-cost training strategies. However low-fidelity didactical tools may reduce motivation and learning outcomes, they may also positively affect skill retention [3, 4]. This study measures motor outcomes of CPR-training and students' motivation to learn CPR with low-cost equipment.

**Methods:** Pupils (N=593, 15-17 years) without previous CPR training were randomised to four training conditions: (1) manikin + teacher instruction (N=43); (2) manikin + video instruction (N=44); (3) foam dice + plastic bag + peers + teacher instruction (N=36); (4) foam dice + plastic bag + peers + video instruction (N=42). In each condition, a 50 minutes training was followed by a three minutes test on a manikin. After 6 months, 165 pupils were retested. 380 pupils completed a closed survey with dichotomous questions about their personal appreciation of the training. Data on motor skills were collected with Skillreporting software® (Laerdal, Norway). Anova was applied to analyse differences between groups with IBM® SPSS® Statistics version 21. Data on the appreciation of the training were analysed by cross tabulation.

**Results:** After six months, ventilation volume (P=0.12), compression depth (P=0.11), compression rate (P=0.101), correct hand position (P=0.46) and correct compressions (P=0.76) showed no differences between groups. For compression depth, the main error was insufficient depth. A quarter of all participants succeeded. Alternative groups retained compression depth better than manikin groups (P<0.05; P<0.05; P=0.873; P=0.154 for group 1,2,3,4 respectively). For compression rate, skill level decreased for group 1 (P<0.001) and 3 (P<0.05) but not for group 2 (P=0.072) and 4 (P=0.954).

Fifty percent of the students preferred more training. Twenty-eight percent would have liked retraining. Groups did not differ (P>0.05). 90% liked the didactical approach. The appreciation did not differ for scenarios 1, 2 and 3 (P<0.05). Group 4 had a significantly different opinion (P<0.001). 35% did not like the methodology. This difference is mainly attributed to the use of alternative equipment, instead of a manikin.

**Conclusion:** These results support the use of low-cost alternative equipment if support by a teacher is provided. The "action-plan-reconstruction hypothesis" may explain the better retention for alternative groups [4]. When shifting from alternative equipment to peers and from training to testing, participants are continuously challenged to reflect about their performance. One training session was perceived as insufficient.

### References

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