

Letter to the Editor

**Comparison of learning outcomes between learning roles (spectator and actor) during an immersive simulation**

ARTICLE INFO

*Keywords:*  
Learning outcomes  
Immersive simulation  
Medical education

We have been very interested in the results reported by Boet et al. [1] and we agree that there is a need to formally assess the learning value that students can gain when they are actors during simulation sessions. According to Kolb et al. [2], the concrete experience provided by high fidelity simulation training is the basis for experiential learning. However, in the real world, there is an increasing imbalance between the growing number of undergraduate and postgraduate students and the human

resources available to deliver high fidelity-based simulation. This imbalance limits development for both initial and repeated training and complicates the logistic organisation of simulation centres. As an example, certain authors report that co-debriefing is an uncommon practice due to logistic constraints, costs and human shortage [3].

Having experienced the same organisational problems, we report our results in a preliminary study, which describes an analysis close to that presented by Lai et al. [1]. In our French university simulation centre, a simulation session for all third to fourth year anaesthesia residents in Paris (Île-de-France) took place in 2014. Each session included a one-day training session with 4 different immersive scenarios using a high fidelity mannequin. Each scenario was attended by three residents who were the actors: one as the anaesthesia resident, the second as a staff anaesthetist and the third as an additional human resource if requested. Residents not involved in the scenario observed the scene with direct video transmission and were called "spectators". Once the scenario was completed, actors and spectators participated in the debriefing led by the teachers. Throughout the one-day training session, each resident thus

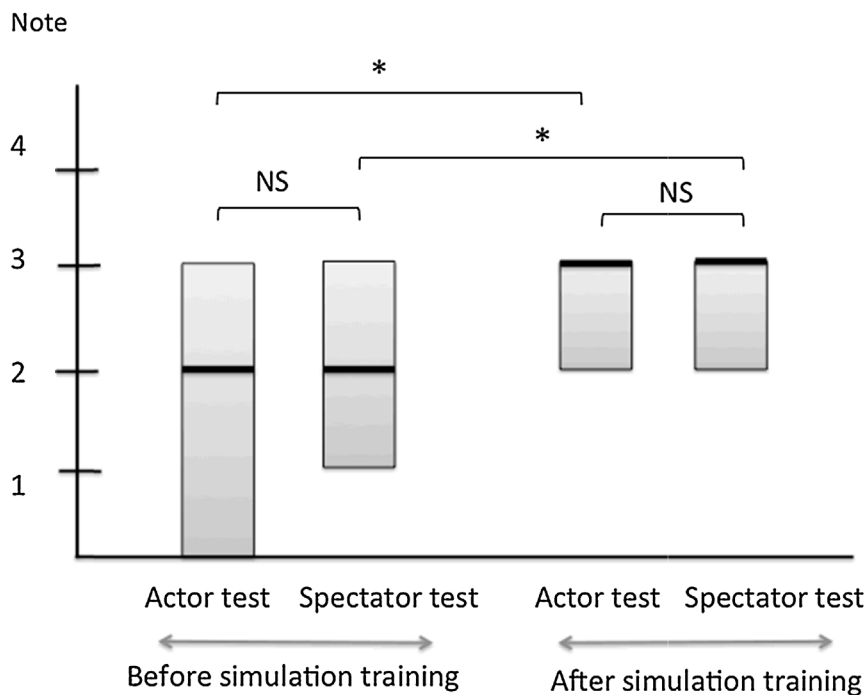


Fig. 1. Results of actor tests and spectator tests before and after simulation training. Median [interquartile range]. \*If  $P < 0.05$ .

\* This study has been previously presented at the SFAR meeting: R532 – year: 2015.

played the role of actor only once and spent the rest of the time as a spectator. All residents agreed to complete a survey of medical knowledge (Kirkpatrick level 2) before and following the one-day simulation session. The survey included 16 multiple-choice questions (4 questions related to each scenario). Responses corresponding to the scenario in which they were actors (“actor test”) (noted 4) were compared to those in which they were spectators (“spectator test”) (noted 4) before and after the simulation programme. Data are expressed as means  $\pm$  SD or medians [interquartile range], as appropriate. Results were assessed using a Wilcoxon test for nonparametric data. A  $P$ -value  $< 0.05$  was considered statistically significant.

Among the 62 residents (third year anaesthesia residents: 70%) included in the simulation training, three were not included in the analysis due to their late arrival. A total of 59 “actor tests” were compared to 189 “spectator tests” (Fig. 1). The trainee playing the role of the additional human resource was always requested at some time in the scenario. Before and at the end of the simulation training, there was no significant difference between the results of actor tests and spectator tests (2 [0–3] versus 2 [1–3],  $P = 0.50$ , respectively and 3 [2–3] versus 3 [2–3],  $P = 0.48$ , respectively). However, a significant improvement in tests results was observed between before and after simulation for both groups ( $P < 0.001$ ).

This preliminary study has shown a similar improvement of medical knowledge whether students assume the role of “actor” or “spectator” during scenarios. One explanation for this result might be related to the fact that all students equally participated in the debriefing sessions, which are thought to be the most important portion of simulation programmes and may be associated with the major part of the learning effect. We did not, however, explore behaviours and non-technical skills in this preliminary study and we acknowledge that this is a significant limit. This essential skill was however studied by Lai et al. who also found similar learning levels between “actors” and “spectators”.

Although further studies are needed, the study by Lai et al. [1], as well as our own data, suggests that learning outcomes could be similar for different student roles in immersive simulation sessions.

## Attestation

The authors approved the final manuscript. They attest to the integrity of the original data and the analysis reported in this manuscript.

## Contribution

The authors helped design the study and write the manuscript.

## Disclosure of interest

The authors declare that they have no competing interest.

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Antonia Blanié<sup>a,b,\*</sup>, Philippe Roulleau<sup>a,b</sup>, Claire Mengelle<sup>a,b</sup>,  
Dan Benhamou<sup>a,b</sup>

<sup>a</sup>Centre de simulation LabForSIMS, Faculté de Médecine Paris Sud,  
94275 Le Kremlin-Bicêtre, France

<sup>b</sup>Département d'anesthésie-réanimation, CHU Bicêtre, 78, rue du  
Général-Leclerc, 94275 Le Kremlin-Bicêtre, France

\*Corresponding author. Département d'anesthésie-réanimation,  
hôpital Bicêtre, groupe hospitalier Paris Sud, France.  
Tel.: +33 1 45 21 34 47; fax: +33 1 45 21 28 75  
E-mail addresses: [antonia.blanie@bct.aphp.fr](mailto:antonia.blanie@bct.aphp.fr) (A. Blanié),  
[philippe.roulleau@bct.aphp.fr](mailto:philippe.roulleau@bct.aphp.fr) (P. Roulleau),  
[mengelleclaire@hotmail.com](mailto:mengelleclaire@hotmail.com) (C. Mengelle),  
[dan.benhamou@bct.aphp.fr](mailto:dan.benhamou@bct.aphp.fr) (D. Benhamou)

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