



Modeling, Simulation and Training Procedural Skills: User experience and acceptability of a virtual reality simulator for scrub nurses in neurosurgery

Marie-Stéphanie Bracq, Estelle Michinov, Bruno Arnaldi, Alexandre Audinot, Benoît Caillaud, Bernard Gibaud, Valérie Gouranton, Pierre-Louis Henaux, Aurélien Lamercherie, Béatrice Nogues, et al.

► To cite this version:

Marie-Stéphanie Bracq, Estelle Michinov, Bruno Arnaldi, Alexandre Audinot, Benoît Caillaud, et al.. Modeling, Simulation and Training Procedural Skills: User experience and acceptability of a virtual reality simulator for scrub nurses in neurosurgery. 19th International Meeting on Simulation in Healthcare (IMSH), Jan 2019, San Antonio, TX, United States. 36, pp.1, 2019. <hal-02123682>

HAL Id: hal-02123682

<https://hal.science/hal-02123682v1>

Submitted on 8 May 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL Authorization

Modeling, Simulation and Training Procedural Skills: user experience and acceptability of a virtual reality simulator for scrub nurses in neurosurgery

Poster ID
#1010-000367
RESEARCH

M.S. Bracq, E. Michinov, B. Arnaldi, A. Audinot, B. Caillaud, B. Gibaud, V. Gouranton, P.L. Henaux, A. Lamercherie, B. Nogues, P. Jannin

Introduction & Purpose

Assess acceptability and user experience of a VR simulation to train procedural skills for scrub nurses with dedicated models and validated tools



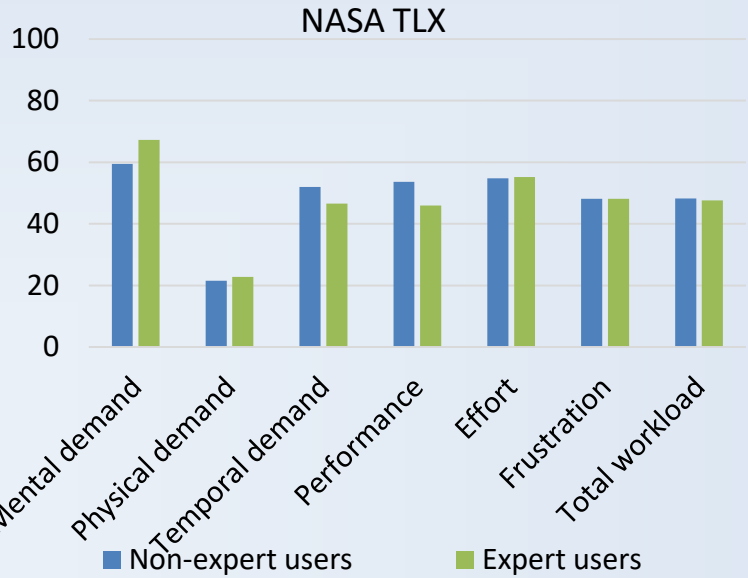
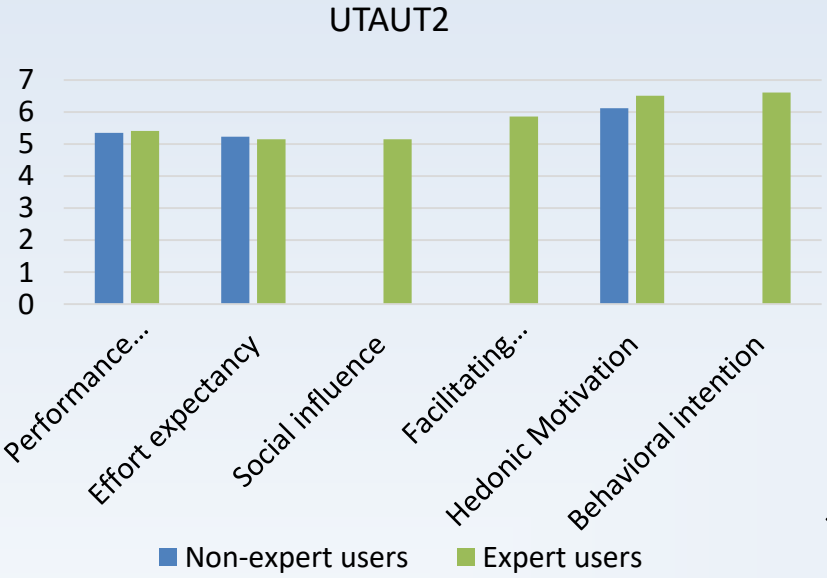
Materials & Methods

- ✓ Scenario based on annotated video observations recorded in the OR
- ✓ 150 surgical instruments and 50 different interactions
- ✓ Acceptability assessed with the Unified Theory of Acceptance and Use of Technology (UTAUT) questionnaire¹
- ✓ User experience assessed with NASA TLX² (workload), SUS questionnaire³ (presence) and SSQ⁴ (simulator sickness)
- ✓ Qualitative data from post test interviews and logs



Results

	Non-expert users	Expert users
Participants	PhD students /students/ engineers 8 males 8 females mean age : 26.6 (SD = 7.54)	Scrub nurses in neurosurgery 13 females mean age : 42 (SD=7.7)
Presence	4.47/7 (SD = 1.14)	5.10/7 (SD = 0.96)
Simulator sickness	3.94/33 (SD =3.39)	3.15/33 (SD =2.97)
Time	13.44 min (SD = 3.65)	14.71 min (SD =19.25)



Discussion and Conclusion

- Acceptability the VR simulator was demonstrated for all participants
- No statistical significant differences regarding age, gender and expertise
- Most participants stressed its pedagogical interest, fun and realism
- VR simulator was validated for initial and vocational training

Limits

- small sample size
- experts from only one specialty and department

Following steps

- Measure transfer of skills to the OR
- Development of Non-Technical Skills (NTS) scenarios
- Intercultural studies

1. Venkatesh V, Thong JY, Xu X. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS quarterly. 2012;36(1):157–178. 2. Hart SG, Staveland LE. Development of NASA-TLX (Task Load Index): Results of Empirical and Theoretical Research. In: Advances in Psychology [Internet]. Elsevier; 1988. 3. Slater M, Usoh M, Steed A. Depth of presence in virtual environments. Presence: Teleoperators & Virtual Environments. 1994;3(2):130–44. 4. Kennedy RS, Lane NE, Berbaum KS, Lilienthal MG. Simulator sickness questionnaire: An enhanced method for quantifying simulator sickness. The international journal of aviation psychology. 1993;3(3):203–20.