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

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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) questionnaire
- User experience assessed with NASA TLX \(^2\) (workload), SUS questionnaire \(^3\) (presence) and SSQ \(^4\) (simulator sickness)
- Qualitative data from post test interviews and logs

**Results**

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

**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

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