



**Figure 1. Representative images of laparoscopic surgery simulators.**

A. Box trainers use synthetic materials that are placed inside the box, real-time performance is captured by a camera and projected on an external monitor.

B. Virtual reality (VR) simulators utilize computers and specially designed laparoscopic arms to generate realistic simulations of laparoscopic surgery.

**Table 1. Comparison of box and virtual reality trainers.**

	<b>Advantages</b>	<b>Disadvantages</b>
<b>Box trainer</b>	<ul style="list-style-type: none"> <li>• Trainees prefer box trainers, owing to more realistic depth perception and tactile sensation [40].</li> <li>• Flexibility of take-home box trainers allows trainees to take a more individualised training approach [41].</li> <li>• Greater construct and predictive validity: better physical representation of the intraoperative environment and predictor of true intraoperative skills [42].</li> </ul>	<ul style="list-style-type: none"> <li>• Only able to teach one specific procedural skill at a time, therefore not suited towards practicing entire operations or advanced skills [14].</li> <li>• Meaningful feedback requires an external expert to demonstrate and appraise, which incurs an additional cost of trained personnel [41].</li> </ul>
<b>Virtual reality trainer</b>	<ul style="list-style-type: none"> <li>• Computers can act as a “virtual tutor”, evaluate performance, and provide real-time feedback [15]. This allows for independent practice, reduces the need for an expert trainer, and eliminates inter-rater variability.</li> </ul>	<ul style="list-style-type: none"> <li>• VR equipment is expensive and therefore less accessible, especially in areas with limited resources [22, 41].</li> <li>• Housed in dedicated facilities or “laboratories”, requiring dedicated maintenance and trained staff [41].</li> </ul>

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- Can simulate entire operations and complex tasks [14].
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