**Note:** Use the table in this document to record your findings comparing two versions of a technology used for teaching and learning in a nursing or health care environment. Delete all instructions from the document before submitting your assessment.

# Part 1

## Description of Technology

## Simulation technologies is nursing education provide students with a platform to practice clinical exercises in a controlled environment. These technologies mimic real life and give students practical knowledge that they could not gain through experimenting on actual patients. There are two categories of simulation technology used in nursing education; the simulation manikins and the virtual reality simulations. Simulation manikins are realistic models of the human required in mimicking different medical conditions and situations (Torres et al., 2022). These manikins are categorized in to low fidelity, that are relatively simple and used for teaching basic skills, and high fidelity which are complex and can replicate physiologically responses. On the other end, virtual reality simulation is an innovative method of nursing education where students are exposed to real life simulation through computerized environments (Clarke, 2021). These simulations are very interactive, offer a full field of view of the simulated environment and thus enable students to practice in virtual reality environment. These simulations are very interactive, offer a 360 degrees full view of the simulated environment and thus enable students to practice in virtual reality environment. Therefore, this comparison will evaluate two versions of these technologies: high-fidelity simulation manikins and virtual reality simulators.

## Comparison of Features, Benefits, and Capabilities

Fill out the table below as follows:

* In the header row, list the names of the two versions of the technology.
* In the left-hand column, describe the features, capabilities, and benefits of the technology that you will compare across the two versions.
* In the middle column, indicate how Version 1 rates on each of the features, benefits, and capabilities listed.
* In the right-hand column, indicate how Version 2 rates on each of the features, benefits, and capabilities listed.

| Feature, Capability, and Benefit | Version 1 (Name): | Version 2 (Name): |
| --- | --- | --- |
|  | **High-Fidelity Simulation Manikins** | **Advanced VR Simulation Platforms** |
| Realism and Fidelity | Highly realistic with physical presence and tactile feedback | Immersive virtual environments with high visual realism |
| Interactivity | Limited to physical interaction with manikins | High interactivity, including voice commands and real-time scenario adjustments |
| Accessibility and Flexibility | Requires physical presence in simulation labs | Accessible remotely, offering flexible learning opportunities |
| Cost | High initial cost and maintenance expenses | Moderate initial cost with lower ongoing expenses |
| Scalability | Limited by physical resources and space | Easily scalable for large groups and remote learners |
| Analytics and Performance Tracking | Basic performance tracking with manual assessments | Detailed analytics and automatic performance tracking |
| Training Scope | Effective for common and some complex scenarios | Suitable for a wide range of scenarios, including rare and complex cases |
| Setup and Maintenance | Requires significant setup and regular maintenance | Minimal setup with low maintenance requirements |
| Learning Engagement | High engagement due to tactile feedback | High engagement through immersive and interactive experiences |
| Collaboration and Team Training | Supports team-based scenarios but limited by physical presence | Facilitates remote collaboration and team-based training sessions |

# Part 2

## Assumptions

**Benefits and Limitations of Technology Comparison**

Comparing educational technologies such as high-fidelity simulation manikins and advanced VR simulation platforms offers several benefits and limitation. The greatest advantage is the opportunity to make a correct choice of the technology that meets the educational requirements and the strategic objectives of an organization. This helps to ensure that technology investments are directed towards enhancing learning outcomes. Also, this comparison helps identify certain situations that require one or another technology, which contributes to creating effective learning processes using the features of each application.

Nevertheless, this kind of comparison has its shortcomings. One limitation is that the comparison could be skewed based on personal preferences or lack of complete information regarding the technologies. Furthermore, the fast rate of development in technology implies that a new feature or an improvement could quickly make some of the comparison outdated. Another weakness is that some of the benefits are likely to be hard to quantify since they include factors like students’ engagement. However, a well-managed comparison can offer useful information and serve as a helpful reference for making decisions.

**Assumptions**

Several assumptions were made while completing the comparison table to simplify the analysis. As such, it was assumed that both high fidelity simulation manikins and advanced virtual reality simulation platforms are easily accessible and can be integrated into the nursing education program. Another assumption was that the institution has the capacity to support the integration of either technology in terms of personnel and finances.

Some attributes of the technology like designs or the brand name was considered as non-critical since they do not influence the teaching and learning process. The comparison was based on key characteristics which determine the efficiency of education, including realism, interactivity, accessibility, cost, and scalability. The justification of the claims about the benefits of each technology is based on the peer-reviewed research.

These assumptions affect decision-making by grounding the evaluation in the practicality of applying and usage. By pointing out these assumptions, the comparison remains based in real-world implications, which makes the conclusions realistic and feasible. This approach is useful in eliminating bias and making sure that the recommendations are well informed by the comprehensive awareness of the educational environment and demands of nursing students and instructors.

## Analysis

**Best Situations for Each Technology**

High fidelity simulation manikins are specifically appropriate in teaching and learning contexts where practical experience and immediate feedback are an important aspect. Some of these include practicing procedural skills like cardiopulmonary resuscitation, administering injections, and catheterization. The realistic presence of the manikins and their reactions give students a practical environment in which they can hone their techniques and muscle memory safely (Zhen et al., 2021). These manikins are also useful for team exercise, for instance, practicing emergency response where cooperation between members is essential. The manikins also offer a feel of the real-life pressures and circumstances, thus making a good learning environment.

Simulation solutions based on advanced VR platforms are most effective in situations that need many different cases, including rare and challenging situations that cannot be modeled using physical manikins. Virtual reality can create and reproduce real-life settings from which students can learn decision-making, critical thinking, and clinical reasoning within a simulation-based environment (Gupta et al., 2023). It is apparent that these platforms are most effective in circumstances where students are not able to attend face-to-face sessions including remote learning. Virtual simulations also ideal for repetitive practice of scenarios since students will be exposed to repeated clinical situations to build up their skills and knowledge.

**Incorporation into Nursing Education Program**

The use of high-fidelity simulation manikins in a nursing education program can greatly improve students’ understanding and practical experiences. These manikins can be incorporated in courses where students perform clinical skills and procedures in the laboratory. Frequent scheduled simulation sessions where by at the end of each session the students can be evaluated on their proficiency and performance can be helpful. The use of these manikins can also facilitate interprofessional education whereby nursing students work with other students in simulated team-based learning activities (Beichler et al., 2024). This integration enhances the understanding of teamwork, communication, and cooperative patient care, which are core competencies in practicing healthcare.

Advanced VR simulation platforms can be easily integrated into a nursing education program as an adjunct to traditional learning modalities and extend the variety of clinical cases. These platforms can be applied in both traditional and online learning environment, which makes them versatile. Within classroom-based learning, VR simulations can be adopted to introduce clinical cases, allowing effective discussions. On the contrary, remote learners can take part in VR platforms from anywhere, which makes learning consistent and flexible (Chen et al., 2020). The use of VR simulations can also assist in competency-based assessments where learners exhibit their clinical skills and decision-making in virtual space.

**Basis for Conclusions**

The conclusions made about the applicability of each technology are based on a correct and insightful understanding of their characteristics, capacities and advantages. High fidelity manikins have high levels of realism and haptic feedback and are best suited for procedural and team based training. On the contrary, advanced VR simulation platforms are more flexible, scalable, and interactive for various learning and realistic clinical cases.

The integration of these technologies in a specific nursing education program will improve learning and performance as students will have a variety of learning experiences. High fidelity manikins help students improve their technical abilities while critical thinking and exposure to a variety of clinical scenarios will improve through the use of VR simulations. The integration of both technologies provides a holistic educational model that can accommodate diverse learning styles of students and the nature of healthcare practice environment.

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