



360° VR Video in Nursing Education: A Transformative Learning Approach

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Dear Editor-in-chief

In the educational landscape, selecting appropriate teaching methods is crucial for enhancing the quality of student learning, particularly in courses with specific requirements. Modern technologies offer diverse and engaging learning opportunities, allowing for personalized experiences that cater to individual abilities and learning styles. These advancements have the potential to significantly improve the effectiveness of teaching and learning processes in contemporary education. Recently, innovative educational technologies, such as video-based instruction, have gained prominence as novel approaches to skill acquisition. The onset of the COVID-19 pandemic accelerated the adoption of virtual training methods, especially in nursing education. However, this transition revealed limitations, as certain nursing skills proved challenging to teach effectively in a purely virtual environment, creating educational hurdles for nursing students. This situation underscored the necessity for a variety of training methodologies capable of ensuring educational continuity in the face of unprecedented challenges like the COVID-19 pandemic. The integration of 360° VR video in nursing education has emerged as a promising solution to address these complex educational needs (1-3). This technology serves as a powerful tool for creating immersive learning experiences, particularly in nursing education. Utilizing omnidirectional cameras or multiple cameras, 360° video captures a complete view of the surroundings, providing viewers with an engaging and immersive experience (4, 5).

Key Words: Benefits, Challenges, Nursing Education, 360° VR Video.

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360° VR technology provides several key benefits in nursing education, including:

- **Enhanced Skill Development:** VR enables nursing students to practice and refine their clinical skills in a safe, virtual environment before applying them on real patients. This approach leads to improved skill acquisition and increased confidence (6).
- **Immersive Learning Experience:** 360° VR creates realistic simulations of clinical scenarios, offering students an immersive and engaging learning environment. Research indicates that 62% of students report positive feelings about the VR experience (6).
- **Safe Learning Environment:** VR provides a risk-free platform for students to make mistakes and learn from them without real-world consequences, thereby facilitating experiential learning (7).
- **Exposure to Diverse Scenarios:** VR allows students to encounter a wide range of medical situations, including rare or complex cases that they may not experience during traditional clinical training (8).
- **Improved Critical Thinking and Decision-Making:** VR scenarios can be designed to require quick assessments and prompt decision-making, helping students develop critical thinking skills under pressure (9).
- **Enhanced Understanding of Anatomy and Physiology:** VR offers immersive 3D visualizations of the human body, enabling students to explore anatomy and physiology in detail, which improves their comprehension and retention of complex concepts (10).
- **Practice in Patient Interaction and Communication:** VR simulations enable students to practice and refine their communication skills across various patient scenarios, including challenging situations (2, 10).
- **Comparable Learning Outcomes:** Studies indicate that VR can achieve learning outcomes comparable to those of traditional face-to-face demonstrations, particularly in the development of psychomotor skills (11).

Based on the search results, the key challenges of 360° VR technology in nursing education include:

- **Technical Difficulties:** Some students find VR systems challenging to operate, necessitating detailed instruction manuals and standardized practice sessions (7).
- **VR Sickness:** Users may experience motion sickness or discomfort while using VR headsets, which can potentially limit the duration and effectiveness of training sessions (11).
- **Limited Realism:** Although immersive, VR may not fully replicate the tactile and emotional aspects of real patient interactions (2).
- **Cost and Accessibility:** High-quality VR equipment can be expensive, which limits widespread adoption, especially in resource-constrained settings (8).
- **Content Development:** Creating high-quality, educationally relevant VR content requires substantial time, expertise, and resources (9).
- **Integration with Existing Curricula:** Incorporating VR technology into established nursing education programs can be challenging, necessitating careful planning and potential restructuring of course content (4).
- **Lack of Standardization:** There is currently no standardized guideline for the use of VR in nursing education, which can lead to inconsistencies in implementation and assessment (6).
- **Reduced Face-to-Face Communication:** VR may affect the development of interpersonal skills and patient-provider relationships (12).

- **Faculty Resistance:** Educators may resist adopting VR due to a lack of familiarity with the technology or concerns about its effectiveness (13).
- **Infrastructure Requirements:** Implementing VR requires reliable internet service, appropriate technological resources, and faculty training (8).

CONCLUSION

The integration of 360° Virtual Reality (VR) technology in nursing education represents a significant advancement in teaching methodologies. By creating immersive learning environments, VR addresses many limitations of traditional approaches, such as passive learning and restricted access to clinical experiences (14). This technology enables nursing students to engage in realistic simulations, enhancing their skill acquisition, decision-making, and confidence in patient interactions (15, 16).

While challenges such as costs and implementation complexities exist, VR offers a cost-effective alternative to high-fidelity simulations, requiring less investment while providing flexible and repeatable training opportunities (15). Furthermore, VR simulations allow students to practice critical skills in a safe environment without risking patient safety and can enhance their communication and interpersonal skills through interactions with virtual patients (17).

To maximize the benefits of 360° VR, nursing educators must thoughtfully incorporate this technology into their curricula. By doing so, they can prepare skilled and adaptable nursing professionals who are ready to meet real-world clinical challenges and improve patient care (18).

AUTHORS' CONTRIBUTIONS

All authors contributed to the study design and data collection. MF primarily wrote the manuscript, with edits and reviews provided by AA and MN. All authors have read and agreed to the published version of the manuscript.

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REFERENCES

1. Chang, C.Y., Sung, H.Y., Guo, J.L., Chang, B.Y., & Kuo, F.R. Effects of spherical video-based virtual reality on nursing students' learning performance in childbirth education training. *Interactive Learning Environments*, 2022;30: 400-16.
2. Ismaile, S. (2017). Virtual reality-360 in nursing education: A method to reduce anxiety among nursing students, Riyadh, April 2017. King Saud University: Research Chair for Health Informatics and Promotion.
3. Tariq EF, Sah PK, Malik A. The plight of COVID-19 pandemic on medical students and residency applicants. *Ann Med Surg (lond)*. 2020; 60:1-4. doi: 10.1016/j.amsu.2020.10.010
4. Baysan A, Çonoğlu G, Özkütük N, Orgun F. Come and see through my eyes: A systematic review of 360-degree video technology in nursing education. *Nurse Educ Today*. 2023 Sep;128:105886. doi: 10.1016/j.nedt.2023.105886.
5. Sandoval-Henríquez FJ, Badilla-Quintana MG. Measuring stimulation and cognitive reactions in middle schoolers after using immersive technology: design and validation of the TINMER questionnaire. *Comput Educ*. 2021;166:104157.
6. Babaita AO, Kako M, Teramoto C, Okamoto M, Hayashi Y, Ohshimo S, Sadamori T, Hattori M, Moriyama M. Face-to-face versus 360° VR video: a comparative study of two teaching methods in nursing education. *BMC Nurs*. 2024 Mar 25;23(1):199. doi: 10.1186/s12912-024-01866-4. PMID: 38523319; PMCID: PMC10962166.
7. Chang, Y.M., & Lai, C.L. Exploring the experiences of nursing students in using immersive virtual reality to learn nursing

skills. *Nurse Education Today*, 2021;97:104670.

8. Chao LF, Huang TY, Moser DK, Chung FF, Lau YT, Xiao X. Development and Pilot Testing of a Non-stress Test Virtual Reality Simulator. *Comput Inform Nurs*. 2022 Jun 1;40(6):357-361. doi: 10.1097/CIN.0000000000000878. PMID: 35670634.

9. Davidsen, J., et al. Collaborative Learning through Immersive Virtual Reality in Healthcare Education. *Medical Education Innovations*, 2024;38(1): 45-57.

10. Pinker J, Dengel A. The potential of 360-degree virtual reality videos and real VR for education. A literative review. *IEEE Comput. Graph Appl*. 2021;41(4):76-891. <https://doi.org/10.1109/MCG.2021.3067999>.

11. Georgieva, D., et al. Virtual Technologies in the Medical Professions-Creation of 360-Degree Environments for Health Care Training. *TEM Journal*, 2021;10:1314-18.

12. Jallad, S., & Işık, A. Immersive Learning: 360° VR in Clinical Skills Training. *International Journal of Medical Education*, 2024;52(3): 78-92.

13. Erin Gratz & Lisa Looney. Faculty Resistance to Change: An Examination of Motivators and Barriers to Teaching Online in Higher Education," *International Journal of*

Online Pedagogy and Course Design (IJOPCD), IGI Global, 2020;10(1):1-14.

14. UNC-Chapel Hill. Nursing students learn through virtual reality program, 2024. Available from <https://www.unc.edu/discover/vr-pilot-program-for-nursing-students-yields-real-benefits/>

15. TCS. Immersive learning: The game-changer in nursing education, 2024. Available from <https://www.tcs.com/what-we-do/industries/education/white-paper/immersive-learning-technology-nursing-education>

16. George R, Titus SK. Benefits and Barriers of Using Virtual Reality in Teaching Undergraduate Nursing Students: A Scoping Review. *Nurse Educ*. 2024 Sep-Oct 01;49(5):E244-E249. doi: 10.1097/NNE.0000000000001660. Epub 2024 Jun 10. PMID: 38857416.

17. Proven Reality. Virtual Reality in Nursing Education: Revolutionary Training, 2024. Available from <https://provenreality.com/virtual-reality-in-nursing-education/>

18. Purdue Global. The Future of Virtual Reality in Nursing Education, 2024. Available from <https://www.purdueglobal.edu/blog/nursing/virtual-reality-nursing-education/>