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Improving Nursing Students' Satisfaction, Self-Confidence and Academic Outcomes Through Remote Immersive Video

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ABSTRACT

The study determines whether students' satisfaction, self-confidence and academic performance improved after using a VR Box in the remote immersive video simulation. The content of these videos includes scenarios such as simulated learning scenes of hospital procedures. The research took place at the General Tinio Campus of the Nueva Ecija University of Science and Technology, College of Nursing, and used a quantitative, pre–posttest quasi-experimental design. In one experiment, the researcher measures the academic performance, the pretest mean score garnered 82.37 and the posttest is 86.53 proving that the remote immersive video can greatly affect the academic outcomes of the students. On the other hand, the satisfaction with the current learning from the use of remote immersive video received an overall weighted mean of 3.61 which was verbally described as "strongly agree." While The self-confidence in learning obtained an overall weighted mean of 3.32 which was verbally described also as "strongly agree". The results clearly showed that incorporating the use of remote immersive video as a teaching tool can enhance students' academic outcomes, satisfaction, and confidence. Remote Immersive video proved to be highly effective in boosting medical students' learning competency, satisfaction and confidence. As a result, educators and medical learners may consider immersive video a valuable and innovative method for curriculum delivery.

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1. INTRODUCTION

The recent COVID-19 pandemic created major disruptions in nursing education, particularly in subjects that required in-person demonstrations and clinical practicum. With the suspension of face-to-face classes, instructors were challenged to deliver psychomotor and clinical skills remotely, prompting the need for innovative technological solutions. In the Philippines, the shift to distance learning was accelerated by safety concerns related to physical contact and clinical exposure (Dewart, 2020).

Immersive video simulation thru the use of VR Box has emerged as one such innovation, offering virtual environments that can simulate real clinical settings. Institutions like Penn State World Campus have demonstrated that immersive videos help nursing students better understand concepts and identify

unsafe environments compared to traditional simulations (Dawson, 2017). Further studies suggest that immersive video technologies enhance interactive learning and help develop interprofessional competencies such as communication and teamwork (Buchman & Henderson, 2018).

Given that nursing education relies heavily on the integration of theoretical knowledge and psychomotor skills—particularly through return demonstrations—the transition to remote learning has posed significant challenges. Remote Immersive video simulation, delivered through tools such as VR Box/headsets, offers a way to enhance rather than replace existing curricula by providing realistic, engaging instructional experiences. This study examines the potential of immersive video technology as an innovative educational tool to support nursing students' learning during and beyond the pandemic.

2. RESEARCH METHOD

The use of Immersive Video Simulation in nursing education was evaluated using a pre-test post-test quasi-experimental, quantitative research design. The research was conducted at the General Tinio Campus of the Nueva Ecija University of Science and Technology, College of Nursing. A sample of thirty nursing students enrolled in NEUST College of Nursing and purposively selected were the subjects of this study. All were level III and currently enrolled in the CON program, all participants were all familiar and with knowledge in return demonstration. A sample size of 30 is often considered sufficient for quasi-experimental designs due to the Central Limit Theorem, which suggests that a sample size of 30 or more approximates a normal distribution, making statistical analysis more reliable. Additionally, quasi-experimental studies are often more feasible with smaller samples than true experiments, especially in situations where random assignment is not possible or ethical.

In this study, the researcher designed a simulation in which students assumed the roles of both observer and nurse within an immersive video environment. When viewed through a VR Box, students were expected to navigate the learning experience independently, without direct instructor guidance. To support learning, an activity form was created to outline procedural steps and include guiding questions that prompted students to analyze, reflect, and draw conclusions. The researcher ensured that this format would not limit students' interaction with the immersive video.

A 360-degree immersive recording depicting a nurse–patient interaction in a hospital-like setting was produced using a specialized camera. Students accessed and engaged with this virtual scenario through a Virtual Reality Headset (VR Box), allowing them to fully immerse themselves in the simulated environment.

To assess the effectiveness of remote immersive video as an enhancement to clinical skills training, both pre-tests and post-tests were administered. These assessments took the form of Return Demonstrations (RetDems), which were developed by clinical instructors responsible for teaching practical nursing skills.

Three RetDem procedures were selected for this study. Participants first completed a pre-test demonstration of all three tasks. They then viewed the immersive video using the VR Box. Afterward, the same three RetDems were administered as a post-test to evaluate changes in performance following the immersive video intervention.

After watching the immersive video simulation, participants completed the questionnaires from the National League for Nursing's Student Satisfaction and Self-Confidence in Learning survey, as well as the simulation design scale (NLN survey; Jeffries & Rizzolo, 2006).

3. RESULT AND DISCUSSION

Scope and Delimitation

This study focused on evaluating the effectiveness of immersive video as an instructional tool for teaching clinical skills and enhancing students' satisfaction, self-confidence and academic performance during remote learning, when in-person training was restricted. The research was conducted with thirty Level III nursing students from the Nueva Ecija University of Science and Technology, chosen based on their internet accessibility and prior familiarity with return demonstrations. Participants provided informed consent, with assurances of confidentiality.

Several delimitations and limitations may influence future replication. The study was restricted to a single nursing institution, where the majority of participants were female—reflecting the student population—and demographic differences in other settings may produce varying results. Because gender can influence experiences with computer-based simulation learning (Kickmeier-Rust et al., 2007), generalizability is limited. Additionally, the technology used was a prototype, and the immersive experience may differ with more advanced equipment or professionally produced videos. Factors such as visual conditions, susceptibility to dizziness, and students' growing familiarity with immersive media could also affect outcomes. Lastly, the small sample size may not have captured all possible challenges associated with the use of immersive video in nursing education.

The socio-demographics of the respondents determine their age and sex.

Table 1. Age and Sex group distribution

Age	Frequency	Percentage
19	10	33.33
20	19	63.33
21	1	3.33
Total	**30**	**100.00**
Sex	**Frequency**	**Percentage**
Female	19	63.33
Male	11	36.67
Total	**30**	**100.00**

Age

The demographic results show that most participants were 20 years old (63.33%), followed by 19-year-olds (33.33%), with only one respondent aged 21 (3.33%). This reflects the younger age distribution of college students in the Philippines following the implementation of the K–12 educational reform, which shifted tertiary enrollment ages beginning in the 2012–2013 school year (Abueva, 2021). As all respondents were Level III nursing students, the concentration of ages below 25 is expected.

In terms of sex, the sample was predominantly female (63.33%), with males representing 36.67% of participants. This imbalance aligns with broader trends in the nursing profession, where societal perceptions and historical gender roles contribute to the continued dominance of women in nursing (Abudari et al., 2016; Folami, 2017). Although male participation in nursing is gradually increasing, nursing remains widely regarded as a female-dominated field, which is reflected in the composition of this study's respondents.

The nursing student's satisfaction and self-confidence in learning after using the remote immersive videos.

The collected survey data from the NLN survey form was first transferred from the Google form to an Excel spreadsheet, and *then into SPSS Statistics 25. The original surveys were compared to the SPSS data set after they were entered into SPSS to ensure participant responses were correctly entered.*

Table 2. Overall weighted mean for Satisfaction with the current learning

Satisfaction with Current Learning	Mean	Verbal Description
The teaching methods used in this simulation were helpful and effective.	3.50	Strongly Agree
The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.	3.70	Strongly Agree
I enjoyed how my instructor taught the simulation.	3.70	Strongly Agree
The teaching materials used in this simulation were motivating and helped me to learn.	3.53	Strongly Agree
The way my instructor(s) taught the simulation was suitable to the way I learn.	3.60	Strongly Agree
Overall Weighted Mean	3.61	Strongly Agree

Satisfaction with current learning

Results from the NLN survey show that students expressed high satisfaction with the simulation activity, with an overall weighted mean of 3.61, interpreted as *strongly agree*. The highest-rated statements (mean = 3.70) indicated that the simulation provided diverse learning materials and that students enjoyed the instructor's approach. The lowest, though still strongly positive, was the usefulness and effectiveness of the teaching methods (mean = 3.50). These findings suggest that integrating immersive video into instruction produces strong student satisfaction and supports positive learning experiences.

Supporting evidence from Thompson-Butel et al. (2019) similarly reports high participant satisfaction with virtual reality–based education, noting improvements in knowledge across multiple domains. Their study highlights VR as a safe, individualized, and effective educational tool, reinforcing the positive satisfaction levels observed in this research.

Table 3. Overall weighted mean for Self-confidence in current learning

Self-confidence in Learning	Mean	Verbal Description
I am confident that I am mastering the content of the simulation activity that my instructors presented to me.	2.80	Agree
I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.	3.23	Agree
I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting	3.30	Strongly Agree
My instructors used helpful resources to teach the simulation.	3.70	Strongly Agree
It is my responsibility as the student to learn what I need to know from this simulation activity.	3.50	Strongly Agree
I know how to get help when I do not understand the concepts covered in the simulation.	3.30	Strongly Agree
I know how to use simulation activities to learn critical aspects of these skills.	3.30	Strongly Agree
It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time.	3.43	Strongly Agree
Overall Weighted Mean	3.32	Strongly Agree

Self-confidence in learning

Survey results on self-confidence in learning revealed an overall weighted mean of 3.32, interpreted as *strongly agree*, indicating that the immersive simulation positively supported students' confidence. The highest-rated item (mean = 3.70) affirmed that instructors used helpful resources during the simulation. Several items, including assuming responsibility for one's own learning and knowing how to seek help, also received strong agreement (means = 3.30–3.50). Two items—confidence in mastering content and belief that the simulation covered critical material—received slightly lower means (2.80–3.23), though still within the *agree* range. Overall, the results suggest that the immersive video contributed to greater self-confidence among participants.

These findings align with Bandura's (1986) view that self-confidence plays a key role in motivation and learning. Similar outcomes were reported in a University of Pennsylvania study on VR-based gynecologic brachytherapy training, where virtual reality enhanced trainees' self-confidence, technical skills, and engagement. Such evidence supports the value of immersive simulations in strengthening learner preparedness and boosting confidence in clinical competencies.

Pre/Post Test Scores

The conceptual test given at both the beginning and the end of the program revealed an average increase in scores. The test consisted of 3 return demonstrations in which the students need to perform the demonstrations based on what is written on their checklists. Students are being graded based on the rubric. Every mistake or error from the demonstrations of the student may result to deduction and for every correct one may result to gain in points. The total scores will then be converted to a percentage. None of the test scores decreased in the post-test and all the 30 students showed varied levels of increase. The raw data is included in Appendix A and the mean test scores, frequency and percentage are shown in the table.

Table 4. Frequency and Percentage distribution result before and after Demonstration

Demonstration 1					
Pre-test	Frequency	Percentage	Post-test	Frequency	Percentage
96 - 100 (Excellent)	0	0.00	96 - 100 (Excellent)	0	0.00
90 - 95 (Very Satisfactory)	0	0.00	90 - 95 (Very Satisfactory)	0	0.00
85 - 89 (Very Good)	2	6.67	85 - 89 (Very Good)	30	100.00

80 - 84 (Good)	28	93.33	80 - 84 (Good)	0	0.00
75 - 79 (Fair)	0	0.00	75 - 79 (Fair)	0	0.00
74 and below (Poor)	0	0.00	74 and below (Poor)	0	0.00
Total	30	100.00	Total	30	100.00
Mean Pre-test: 82.37 (Good)			Mean Post-test: 86.53 (Very Good)		

Demonstration 2

Pre-test	Frequency	Percentage	Post-test	Frequency	Percentage
96 - 100 (Excellent)	0	0.00	96 - 100 (Excellent)	0	0.00
90 - 95 (Very Satisfactory)	0	0.00	90 - 95 (Very Satisfactory)	1	3.33
85 - 89 (Very Good)	9	30.00	85 - 89 (Very Good)	29	96.67
80 - 84 (Good)	21	70.00	80 - 84 (Good)	0	0.00
75 - 79 (Fair)	0	0.00	75 - 79 (Fair)	0	0.00
74 and below (Poor)	0	0.00	74 and below (Poor)	0	0.00
Total	30	100.00	Total	30	100.00
Mean Pre-test: 83.73 (Good)			Mean Post-test: 87.07 (Very Good)		

Demonstration 3

Pre-test	Frequency	Percentage	Post-test	Frequency	Percentage
96 - 100 (Excellent)	0	0.00	96 - 100 (Excellent)	0	0.00
90 - 95 (Very Satisfactory)	0	0.00	90 - 95 (Very Satisfactory)	3	10.00
85 - 89 (Very Good)	13	43.33	85 - 89 (Very Good)	27	90.00
80 - 84 (Good)	17	56.67	80 - 84 (Good)	0	0.00
75 - 79 (Fair)	0	0.00	75 - 79 (Fair)	0	0.00
74 and below (Poor)	0	0.00	74 and below (Poor)	0	0.00
Total	30	100.00	Total	30	100.00
Mean Pre-test: 84.40 (Good)			Mean Post-test: 87.37 (Very Good)		

Demonstration 1 pre-test revealed that two of the respondents or equivalent to 6.67% received a score of “Very Good” while the remaining 28 respondents or 93.33% are “Good”. The results from the first demonstration shows that the activity on pre-test in general was perceived as “Good” with a mean of 82.37. The post-test shows that all respondents are “Very Good” with a percentage of 100%, it garnered a mean of 86.53 which is considered as “Very Good”.

Demonstration 2 pre-test revealed that nine of the respondents or equivalent to 30% garnered a score of “Very Good” while the 21 students or 70% are “Good” -the mean result from the pre test is 83.73 which is interpreted as “Good”. The post test shows that there is 1 respondent or 3.33% score a “Very Satisfactory” while 29 or 96.67% are “Very Good”. The mean result for post test is 87.07 which is interpreted as “Very Good”.

Demonstration 3 pre-test shows that 13 respondents or equivalent to 43.33% scores “Very Good” while the remaining 17 or 56.67% are “Good”. The results from the third demonstration shows that the activity on pre-test was perceived as “Good” with a mean of 84.40. The post test shows that three respondents or 10% garnered a score of “Very Satisfactory”, the remaining 27 or 90% respondents are “Very Good”. It garnered a mean score of 87.37 or interpreted as “Very Good”.

Table 5. The results of three return demonstrations

	Mean Demo 1	Mean Demo 2	Mean Demo 3
Pre-test	82.37	83.73	84.4
Post-test	86.53	87.07	87.37

Results from the three return demonstrations showed a clear improvement in post-test scores, indicating that the immersive video activity effectively supported competency development. All participants demonstrated enhanced skills after the intervention, suggesting that immersive simulations strengthened their clinical performance. This aligns with existing literature, which reports that immersive environments improve cognitive flexibility, attention, memory, and problem-solving (Association for Language Learning, n.d.) and significantly increase students' preparedness and confidence in clinical settings (Aggar et al., 2018).

Prior research also supports immersive simulation as a highly effective method for building clinical knowledge and technical abilities (Bracq et al., 2019). Immersive video and virtual reality allow repeated, risk-free practice, making them cost-efficient and beneficial for developing confidence and proficiency in complex clinical tasks (King et al., 2018). Studies such as Thompson et al. (2016) and Blair (2021) similarly observed positive outcomes, including improved readiness for clinical practice, enhanced attention, greater user confidence, and increased motivation.

Overall, immersive video simulation encourages active, student-centered learning, allowing learners to "learn by doing" through realistic, interactive environments. This supports the pedagogical approach used in return demonstrations at NEUST-CoN and reinforces the value of immersive technology in developing clinical competence, reflection, and problem-solving skills.

The simulation design and importance of immersive video, and its objective and information, support, problem solving, feedback/guided reflection, and fidelity

Table 6. Agreeability in simulation design of immersive video.

Simulation Design Scale	Mean	Verbal Description
Objectives and Information		
1. There was enough information provided at the beginning of the simulation to provide direction and encouragement.	3.57	Strongly Agree
2. I clearly understood the purpose and objectives of the simulation.	3.63	Strongly Agree
3, The simulation provided enough information in a clear matter for me to problem-solve the situation.	3.53	Strongly Agree
4, There was enough information provided to me during the simulation.	3.53	Strongly Agree
5. The cues were appropriate and geared to promote my understanding.	3.33	Strongly Agree
Overall Weighted Mean	3.52	Strongly Agree
Support		
6. Support was offered in a timely manner.	3.43	Strongly Agree
7. My need for help was recognized.	3.40	Strongly Agree
8. I felt supported by the teacher's assistance during the simulation.	3.60	Strongly Agree
9. I was supported in the learning process.	3.47	Strongly Agree
Overall Weighted Mean	3.48	Strongly Agree
Problem Solving		
10. Independent problem-solving was facilitated.	3.50	Strongly Agree
11. I was encouraged to explore all possibilities of the simulation.	3.63	Strongly Agree
12. The simulation was designed for my specific level of knowledge and skills.	3.60	Strongly Agree
13. The simulation allowed me the opportunity to prioritize nursing assessments and care.	3.53	Strongly Agree
14. The simulation provided me an opportunity to goal set for my patient.	3.57	Strongly Agree
Overall Weighted Mean	3.57	Strongly Agree
Feedback/Guided Reflection		

Simulation Design Scale	Mean	Verbal Description
15. Feedback provided was constructive.	3.30	Strongly Agree
16. Feedback was provided in a timely manner.	3.43	Strongly Agree
17. The simulation allowed me to analyze my own behavior and actions.	3.23	Agree
18. There was an opportunity after the simulation to obtain guidance/feedback from the teacher in order to build knowledge to another level.	3.33	Strongly Agree
Overall Weighted Mean	3.33	Strongly Agree
Fidelity (Realism)		
19. The scenario resembled a real-life situation.	3.43	Strongly Agree
20. Real life factors, situations, and variables were built into the simulation scenario.	3.50	Strongly Agree
Overall Weighted Mean	3.47	Strongly Agree

The evaluation of the simulation design across five key elements—Objectives and Information, Support, Problem Solving, Feedback/Guided Reflection, and Fidelity—demonstrated strong agreement among participants regarding the effectiveness of the immersive video simulation.

- **Objectives and Information** scored an overall weighted mean of 3.52 (*Strongly Agree*), with the highest agreement on clarity of purpose and objectives (3.63) and the lowest on appropriateness of cues (3.33).
- **Support** received a mean of 3.48 (*Strongly Agree*), with students feeling most supported by teacher assistance (3.60) and least on recognition of their need for help (3.40).
- **Problem Solving** scored 3.57 (*Strongly Agree*), highest for encouragement to explore all possibilities (3.63) and lowest for facilitation of independent problem-solving (3.50).
- **Feedback/Guided Reflection** had a mean of 3.33 (*Strongly Agree*), with timely feedback rated highest (3.43) and self-analysis of actions rated lowest (3.23, *Agree*).
- **Fidelity** scored 3.47 (*Strongly Agree*), with realistic factors in scenarios rated highest (3.50) and resemblance to real-life situations rated slightly lower (3.43).

Overall, the findings indicate that participants strongly agreed that the simulation design was effective in providing clear objectives, adequate support, opportunities for problem-solving, timely feedback, and realistic, immersive experiences.

Table 7. Importance of simulation design of immersive video

Simulation Design Scale	Mean	Verbal Description
Objectives and Information		
1. The simulation gives me an encouragement.	3.70	Very Important
2. The objective of the simulation were clear and understandable.	3.63	Very Important
3. The purpose and objective were provided by teacher.	3.60	Very Important
4. I received concise information during simulation.	3.67	Very Important
5. Simulation outfitted to advance my understanding on the subject matter.	3.57	Very Important
Overall Weighted Mean	3.63	Very Important
Support	Mean	Verbal Description
6. Support was offered in a timely manner.	3.60	Very Important
7. My need for help was recognized.	3.50	Very Important
8. I felt supported by the teacher's assistance during the simulation.	3.63	Very Important
9. I was supported in the learning process.	3.70	Very Important
Overall Weighted Mean	3.61	Very Important
Problem Solving	Mean	Verbal Description
10. Independent problem-solving was facilitated.	3.57	Very Important

Simulation Design Scale	Mean	Verbal Description
11. I was encouraged to explore all possibilities of the simulation.	3.67	Very Important
12. The simulation was designed for my specific level of knowledge and skills.	3.77	Very Important
13. The simulation allowed me the opportunity to prioritize nursing assessments and care.	3.77	Very Important
14. The simulation provided me an opportunity to goal set for my patient.	3.63	Very Important
Overall Weighted Mean	3.68	Very Important
Feedback/Guided Reflection	Mean	Verbal Description
15. Feedback provided was constructive.	3.67	Very Important
16. Feedback was provided in a timely manner.	3.67	Very Important
17. The simulation allowed me to analyze my own behavior and actions.	3.33	Very Important
18. There was an opportunity after the simulation to obtain guidance/feedback from the teacher in order to build knowledge to another level.	4.00	Very Important
Overall Weighted Mean	3.67	Very Important
Fidelity (Realism)	Mean	Verbal Description
19. The scenario resembled a real-life situation.	3.80	Very Important
20. Real life factors, situations, and variables were built into the simulation scenario.	3.80	Very Important
Overall Weighted Mean	3.80	Very Important

The study assessed the perceived importance of five elements in the immersive video simulation design: Objectives and Information, Support, Problem Solving, Feedback/Guided Reflection, and Fidelity. All elements were rated as *very important* by participants.

- **Objectives and Information** received a mean of 3.63, with the highest-rated item being "The simulation gives me encouragement" (3.70).
- **Support** scored 3.61, with participants valuing teacher assistance most (3.70).
- **Problem Solving** had a mean of 3.68, with the highest indicators emphasizing level-appropriate design and prioritization of nursing assessments (3.77).
- **Feedback/Guided Reflection** scored 3.67, with post-simulation guidance rated highest (4.00).
- **Fidelity** received the highest overall mean at 3.80, with realism and inclusion of real-life factors equally emphasized.

These results indicate that participants strongly recognize the significance of well-designed immersive simulations in enhancing clinical learning, decision-making, and confidence. Consistent with prior research, immersive simulation helps bridge the gap between theory and practice, promotes safe experiential learning, and supports student acceptance of technology in medical education (Koukourikos et al., 2021; Sezer & Yilmaz, 2019; Ahmet B.U. et al., 2020). Properly integrated virtual reality simulations can provide interactive, effective, and realistic learning experiences, improving student performance and outcomes in complex clinical tasks.

In one research by Zeynep Taçgın (2020), "The perceived effectiveness regarding Immersive Virtual Reality learning environments changes by the prior knowledge of learners", The findings of the study stress the importance of designing immersive simulations while taking into account the desired learning outcomes, abilities, and expectations of the learners themselves. According to the findings of the study, immersion simulation that is targeted and well-designed can help to increase the confidence of learners or students in practical abilities. Instructors and Learners can use this type of activity to synthesize and put what they've learned in formal courses and/or clinical experiences into practice. Using this immersive simulation as an instructional technique might improve patient safety and results by allowing nursing students to "practice" critical thinking, clinical decision-making, and psychomotor skills without putting a live patient in harm's way. Errors can be tolerated and addressed without regard for the safety of the patient.

Significant differences before and after using the Remote-Immersive Video.

Table 8. Results of Significant differences before and after using the Remote-Immersive Video

Demonstration	Pre-test Mean	Post-test Mean	t value	p value	Verbal Description
Demo 1	82.37	86.53	-23.157	0.000	Significant
Demo 2	83.73	87.07	-25.673	0.000	Significant
Demo 3	84.40	87.37	-18.259	0.000	Significant

*.Significant at 0.05 level

The comparison of pre-test and post-test scores across three return demonstrations revealed significant improvements in student performance. In Demo 1, scores increased from 82.37 to 86.53 ($t = -23.157$, $p < 0.05$); in Demo 2, from 83.73 to 87.07 ($t = -25.673$, $p < 0.05$); and in Demo 3, from 84.40 to 87.37 ($t = -18.259$, $p < 0.05$). These results indicate a statistically significant difference between pre- and post-test scores, leading to the rejection of the null hypothesis.

The findings demonstrate that integrating remote immersive video into nursing education effectively enhances students' competencies, critical thinking, and mastery of clinical skills. Similar studies support these results, showing that simulation and immersive video improve psychomotor skills, learning motivation, and overall competency in medical and nursing education (Kim, 2016; Mian Usman Sattar, 2019; Hamilton et al., 2020; Kaplan-Rakowski, 2021). Immersive video provides a safe, interactive, and reproducible environment for practicing clinical scenarios, making it a valuable pedagogical tool for reinforcing theoretical knowledge and hands-on skills.

Immersive simulation training has been shown to effectively enhance knowledge acquisition, skills, and confidence in healthcare education (Bracq, Michinov, & Jannin, 2019). Virtual reality allows medical students to practice clinical scenarios safely, eliminating risks to patients while providing interactive, experiential learning. Additionally, immersive simulation is a cost-effective method for repeated practice of complex procedures, helping students develop competence in tasks ranging from symptom recognition to performing intricate surgeries (King et al., 2018).

Satisfaction and Self-confidence before and after using the Remote-Immersive Video

Table 9. Significant differences for student's satisfaction before and after using the remote-immersive video

Demonstration 1		
Satisfaction with current Learning	Pre-test	Post-test
Mean	Mean	Mean
3.70 (12)	82.08	86.16
3.60 (6)	82.33	86.41
3.53 (6)	82.66	86.5
3.50 (6)	82.66	87.16
F ratio	F =.936; p>0.05	F =.468; p>0.05
Demonstration 2		
Satisfaction with current Learning	Pre-test	Post-test
Mean	Mean	Mean
3.70 (12)	83.16	86.50
3.60 (6)	83.66	87.00
3.53 (6)	83.83	87.16
3.50 (6)	84.00	87.50
F ratio	F =.714; p>0.05	F =.476; p>0.05
Demonstration 3		
Satisfaction with current Learning	Pre-test	Post-test
Mean	Mean	Mean

3.70 (12)	83.83	86.83
3.60 (6)	84.33	87.42
3.53 (6)	84.50	87.50
3.50 (6)	84.66	87.87
F ratio	F =.660; p>0.05	F =.724; p>0.05

Analysis of pre-test scores across the three demonstrations revealed no significant differences in respondents' performance when grouped according to their satisfaction with current learning. For Demonstration 1, the F ratio was 0.936 ($p > 0.05$); for Demonstration 2, 0.714 ($p > 0.05$); and for Demonstration 3, 0.660 ($p > 0.05$). These results indicate that students' satisfaction with their current learning did not significantly influence their initial performance on any of the demonstrations.

Table 10. Significant differences for student's self-confidence before and after using the remote-immersive video

Demonstration 1		
Self-confidence in Learning	Pre-test	Post-test
Mean	Mean	Mean
3.70 (4)	83.25	86.75
3.50 (4)	83.50	87.25
3.43 (3)	81.66	86.33
3.30 (11)	81.18	85.9
3.23 (4)	83.25	86.75
2.80 (4)	83.25	87.25
F ratio	F=.318; p>0.05	F=.674; p>0.05
Demonstration 2		
Self-confidence in Learning	Pre-test	Post-test
Mean	Mean	Mean
3.70 (4)	84.50	87.00
3.50 (4)	84.00	87.25
3.43 (3)	83.33	86.67
3.30 (11)	83.00	86.54
3.23 (4)	84.00	87.50
2.80 (4)	84.75	88.25
F ratio	F=.497; p>0.05	F=.410; p>0.05
Demonstration 3		
Self-confidence in Learning	Pre-test	Post-test
Mean	Mean	Mean
3.70 (4)	85.00	87.25
3.50 (4)	84.75	87.50
3.43 (3)	84.00	86.67
3.30 (11)	83.81	86.82
3.23 (4)	84.75	88.00
2.80 (4)	85.00	88.75
F ratio	F=.826; p>0.05	F=.313; p>0.05

Analysis of pre-test scores across the three demonstrations showed no statistically significant differences in relation to students' self-confidence. For Demonstration 1, the F ratio was 0.318 ($p > 0.05$);

Demonstration 2, 0.497 ($p > 0.05$); and Demonstration 3, 0.826 ($p > 0.05$). These findings indicate that self-confidence did not significantly affect initial performance. Similarly, analysis of pre- and post-test scores showed no statistically significant differences in student satisfaction and self-confidence, although minor variations in means were observed.

Despite the lack of statistical significance, prior research suggests that immersive video can enhance attention, skill development, confidence, and user satisfaction (Blair, 2021; Kim, 2016). Immersive 360° videos elicit emotional and cognitive responses similar to real-life experiences, which positively influence motivation and learning outcomes. Frequent use of immersive video may further improve satisfaction and self-confidence (Nation, 2020). Given its portability, flexibility, and ability to replicate realistic scenarios, immersive video is a promising pedagogical tool, particularly in health and social care education, and may play an increasingly important role in post-pandemic training methods.

Participant Perceptions of 360-Degree Immersive Video

The most significant and clear implications in this study were the open-ended written questions asked of respondents who watched the remote immersive video. 17 Participants provided generally mixed positive and negative feedback and also some challenges on the technology's use, there was also an expressed of enthusiasm for its application in nursing education, while 13 of the respondents did not write any feedback and omitted this section since answering this question is optional. Responses from participants on what are the problems and/or challenges did the nursing student respondent's encounter during the use of the immersive video's simulation activities are discussed further below that could help guide the development of remote immersive video content in the future.

While respondents did provide items they found challenging about the remote immersive video, it's worth noting that the open-ended question was worded negatively and asked for negative feedback. It's possible that the question's wording led to an overabundance of responses focusing on the negative aspects of remote immersive video.

Five of the respondents reported a connection related problem while using the immersive video. one respondent mentioned "*Connection problem*", another one is "*Just the connection of our internet when i'm watching, it becomes blurred",* third respondent says *"Internet connection kapag po mabagal signal, nagbblur po yung video*", also "Internet *connection*", and lastly "*Sa simulation po mismo wala, pero in terms of internet connection may problem. Mabagal po and low quality na yong video".* Since this technology requires an internet connection, a simple fluctuation may hinder the graphics and resolutions causing the user or the respondents silently suffer from the stuttering play and constant pausing associated with this slow Internet connections. The Philippines' average peak internet connection speed may be faster than that of several other countries in the Asia-Pacific region, but the country's low use of broadband technology, combined with high costs for internet users in comparison to other countries, results in slow average connection speeds for consumers especially to the rural area. Mia Rodriguez (2020) quoted in her article that the Philippines' internet connection speed is still deplorable. According to Ookla's Speedtest data from August 2020, the Philippines ranks near the bottom of the global index in terms of average mobile and broadband speeds. "We clocked in at a snail's pace of 16.44 Mbps for mobile downloads, placing us 119th out of 139, and 25.34 Mbps for broadband, placing us 106th out of 174". The slow internet connection in the country is one of the painful realities that every Filipino must face. This may sound a downfall to the immersive video but with good connection, the immersive video may still deliver its learning objective to the user.

After watching the immersive video, three respondents reported dizziness and other symptoms. They said "*I got confused at first. I got dizzy may be because it is my first try",* another one is *"I encountered problem while using a VR box, it's not really well suited with my phone, plus it keeps hitting the volume button and almost hit the power button, also I tried watching it without the VR box it can make someone really dizzy",* last one *"I feel dizzy at some times*". There have been reports of mild, moderate, and severe dizziness or vertigo (University of Michigan, 2018). The dizziness experienced in this study was mild, as it did not cause vomiting or the need to lie down, and participants appeared to be in good health both during and after the experiment. Even if minimal dizziness is experienced, these findings have important implications for the use of immersive video in nursing education. There are also ways to minimize the dizziness (Sophie Thompson, 2020) such as choose the right headset (VR Box); gradually increase time spent in VR Box, and take it slowly and control your breathing. There are a variety of reasons why you may have experienced dizziness in virtual reality, some of which are the fault of the creators and others of which just require your body to acclimate to this unique sensation. As your brain and body get a better grasp of what you're experiencing, your body will gradually acclimatize to being in immersive video.

Three respondents reported a problem on the angle and viewing of the immersive video such as "*medyo mahirap po hanapin yung tamang angle for better viewing po*", another one mentioned "*It is quite*

hard to watch because of the angle of the video" and the third one said *"the video quality[itself]".* These reports are all related to the calibration of the gadgets and/or VR Box that the user was using. Even on high-end VR Box like oculus rift or Samsung VR headset, users also experienced this situation. Kaylee Fagan (2018) The convoluted answer is that everyone experiences VR differently, and not all VR headsets or platforms are made equal, thus certain games/videos will cause more problems on certain headsets for certain people than others. The solution is simple and preventable, just a little calibration on the gadgets and it will do the job. The immersive video in education is still young and immature, it requires more time and studies to perfect this. Developers and startups are still continuing to explore VR's uses in industry, retail, education, healthcare, therapy and journalism.

Five respondents gave positive feedback such as "*Since not most of us have a VR box/goggles, the video screen is kind of shaky if you are using a phone. Nonetheless, the video is very informative and kind of interactive that it feels like you're actually there*" also "*Wala pong problem, in fact sobrang nakakatuwa po gumamit ng bago niyong technology",* another respondent mentioned *"…the video is amazing because this is the first time I watched video like this, and it amazes me because now I'm aware there's a device that can be used to convert the video on a vr box video .Thank you sir for amazing experience and amazing knowledge you taught",* another one said *"It goes well naman po",* and lastly *"The simulation delivered the lesson in a very comprehensive way and it is much better to use VR set. The only problem is that not all the students have VR set thus making the* simulation *uncomfortable"*. Immersive video technology corresponded to a more favorable attitude from respondents toward this test -the use of Immersive video, since all of the respondents are first timer in utilizing immersive video it has a positive effect on their decision, satisfaction and experience. With the respondents unable to attend university, it is a leap to another experience. In the study conducted by Georgios Lampropoulos et. Al (2021) it can be said that the majority of people found 360° video (Immersive Video) as a useful daily tool. The majority of participants in his study saw 360° video as an instructional tool favourably, according to the findings on its usage in education.

Lastly, one student answered the question in the survey showing mix positive and unsatisfaction in the content of the video. The student said "Lacking of small rationale why we should puncture on the side of the finger, over all the presentation was good". One of the videos is about blood extraction and the rationale was omitted intentionally for further discussion and not a limitation of the immersive video. The respondents were encouraged to study beyond what the immersive video offers, this is to promote self study. According to Kåre Hauge (2021) Self-study is a valuable technique and instrument that may be used to prepare teacher educators and students for a variety of objectives. Every teacher strives to instill in students a strong desire to know or learn something, and research has even proved that curiosity is beneficial to learning.

While the equipment used in this study was new and technologically adequate for immersive video, more expensive immersive video viewers may provide a better user experience and lower risk. A professionally produced immersive video with better video production, audio quality, and image stability, on the other hand, could have provided a better user experience (John Arthur Nation, 2020). As mentioned before, the technology is still young especially in the Philippines where there is only limited literature about its use in the education in medical courses. It is expected to see and encounter many limitations, problems, and challenges on its usage. Despite those limitations mentioned above, this study found that simulation-based nursing education has an educational impact, with particularly strong effects in the psychomotor domain. Furthermore, a recent study found that debriefing was the most important factor in simulation, with both self-debriefing and video-facilitated instructor debriefing having positive effects. Based on these findings, the clinical reflection process needs to be improved in order to improve cognitive learning effects.

Implications to the learning experiences of the students in clinical teaching skills.

Use in Simulation

Respondents were generally satisfied with the immersive video, had more satisfaction with immersive video than conventional video at times, and would like it to be incorporated into their nursing education simulation experiences, according to the findings of this study. Simulation activities in nursing education, on the other hand, are almost always required, especially when clinical time is required. This technology should not be used in nursing education at this time, based on the findings that dizziness is a very real possibility for at least some participants when watching the immersive video.

Use as Instructional Tool

In addition, the immersive video from afar could be used for optional education. Several participants in this study stated that they would like to see immersive video used in nursing skill instruction and that they liked how personalized it is. Students who did not want to use immersive video would simply skip this additional instructional resource because it would be a voluntary, individual activity. Similarly,

when students are absent and must complete make-up hours, immersive video could be used as an optional component of clinical activities. Immersive video could make clinical make-up work more realistic, especially now that the world is in the midst of a pandemic and clinical duties and face-to-face classes are very limited. Making the immersive video activity optional would allow students who experience dizziness while using the technology to switch to a different method of learning.

Immersive Video Development

In a simulated health-care setting, this immersive video scenario was shot from the perspective of a nurse instructor. While the nurse's point of view provided a more realistic picture of a nurse's experience in a hospital setting, it's possible that the frequent camera movement associated with this point of view increased the risk of users becoming dizzy. Future Immersive Videos may use a stationary camera to reduce dizziness while still allowing users to immerse themselves in a clinical setting.

When creating an immersive video, a traditional video of the same scenario should also be created as a backup for students who do not want to watch the immersive video. Some immersive video cameras can capture both a traditional video and a 360-degree immersive video at the same time, reducing the amount of extra work required to create two videos of the same video scenario.

Consideration of Cost

Many nursing schools must carefully consider the cost of the equipment they use in their programs and make difficult budget decisions. While the cost of immersive video cameras and viewers has steadily decreased, the absolute minimum cost of ten immersive video viewers and an immersive video camera would be between 50,000 and 100,000 pesos. The cost of using a higher-quality viewer or camera in a nursing school would skyrocket.

While participants in this study reported higher levels of satisfaction with immersive video, it is worth noting that due to the high cost of the technology required, it would also incur additional costs. Many participants, for example, expressed a desire for interactive video simulations, which can be made interactive in both immersive and traditional video simulations. Because of their familiarity with traditional video editing tools, nursing programs will most likely find it easier to create interactive conventional video simulation activities than interactive immersive video simulation activities. While immersive video has a lot of potential, the cost of the equipment required would add to the overall production cost.

Hypothesis

The experiment that was conducted for this research compare the results of Pre-Post Tests from three demonstrations done by respondents. The researcher suggests that Immersive Video application has a more positive effect on self-confidence, satisfaction, and academic outcome. Therefore, the researcher can accept and reject the following hypotheses:

Ho 1: There is no significant difference in the students' scores on the test before and after using the Remote-Immersive Video.

Ho 2: There is no significant difference in the students' self-confidence before and after using the Remote-Immersive Video.

Table 11. Results for significant difference in the students' Pre-Post Test scores

Demonstration	Pre-test Mean	Post-test Mean	t value	p value	Verbal Description
Demo 1	82.37	86.53	-23.157	0.000	Significant
Demo 2	83.73	87.07	-25.673	0.000	Significant
Demo 3	84.40	87.37	-18.259	0.000	Significant

*.Signifcant at 0.05 level

To estimate the probability of students' competencies from experiment by group are significantly similar, the researcher used the Student's t-test (Gosset, 1908), using a null hypothesis (H0) that stated that there is no significant difference in the students' scores on the test before and after using the Remote-Immersive Video. It is evident in demo 1, that the respondents' pre-test scores were 82.37, while the post-test scores were 86.53. The computed t value was -23.157, $p<0.05$ level of significant. While on demo 2, the respondents' pre-test scores were 83.73, while the post-test scores were 87.07. The computed t value was -25.673, $p<0.05$ level of significant. Lastly, on demo 3, the respondents' pre-test scores were 84.40, while the post-test scores were 87.37. The computed t value was -18.259, $p<0.05$ level of significant. These results meant that there are significant differences in the pre-test and post-test scores of the respondents for these three demonstrations. The hypothesis of no significant difference is rejected.

Table 13. Summary for Significant differences for student's self-confidence before and after using the remote-immersive video

	Demonstration 1	
Self-confidence in Learning	Pre-test	Post-test
F ratio	F=.318; p>0.05	F=.674; p>0.05
	Demonstration 2	
Self-confidence in Learning	Pre-test	Post-test
F ratio	F=.497; p>0.05	F=.410; p>0.05
	Demonstration 3	
Self-confidence in Learning	Pre-test	Post-test
F ratio	F=.826; p>0.05	F=.313; p>0.05

To estimate the probability of students' self-confidence from experiment by group are significantly similar, the researcher used the Student's t-test (Gosset, 1908), using a null hypothesis (H0) that stated that there is no significant difference in the students' self-confidence before and after using the Remote-Immersive Video. Table 13 shows the significant difference when groups are based on self-confidence with the current learning. It is evident that the mean scores of the respondents yielded different means based on the responses of the respondents. Demo 1 has a computed F ratio of .318, with a p value of >0.05, the yielded result shows that the hypothesis of no significant difference was also accepted. The computed F ratio of Demo 2 was .497, with a p value of >0.05. Again, the hypothesis of no significant difference was also accepted. The Demo 3 yielded a computed F ratio of .826, with a p value of >0.05 which means that the hypothesis of no significant difference was also accepted.

4. CONCLUSION

This study examined whether remote immersive video could enhance nursing students' self-confidence, satisfaction and academic performance. Findings showed that after viewing the immersive video, students demonstrated high levels of satisfaction and confidence, and their competency scores significantly improved across all three return demonstrations. Statistical analysis confirmed a substantial difference between pre-test and post-test performance, indicating that immersive video effectively supported skills development.

However, no significant difference was found in students' self-reported satisfaction and confidence before and after the intervention, suggesting that these perceptions may require repeated exposure to the technology to show measurable change. Qualitative responses indicated generally positive attitudes toward using immersive video in nursing education, though some students experienced dizziness, highlighting the need for optional alternatives in required activities.

Overall, the results suggest that immersive video is a valuable supplemental tool that can enhance competency-based learning in nursing education, but it should be implemented with consideration for learner comfort and accessibility.

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