Level Of Satisfaction And Confidence After Using Virtual Reality Simulation Of Wound Care Skills In Nursing Students

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Abstract

Virtual laboratory practice using virtual reality provides conveniences and increases learning outcomes, beside physical laboratories requires expensive costs, ineffective and efficient, and limited space causes a decrease in learning levels and impacted to satisfaction and confidence. This study aims to identify satisfaction and confidence of nursing students in learning using Virtual Reality of Wound Care Skills. The research design using descriptive quantitative. In this study, 56 nursing students used as samples using quota sampling technique. Student Satisfaction and Self-Confidence in Learning Scale (SCSL) is the instrument used in this study. Meanwhile, data analysis was performed using IBM SPSS software version 26 with univariate analysis method and presented in the form of distribution frequency tables, yield percentages, mean, and deviations standard. This study shows that students are very satisfied (M = 4.400; SD = 0.670) and very confident (M = 4.357; SD = 0.622) in learning using Virtual Reality of Wound Care Skills. Results obtained from the use of virtual reality learning simulations on student satisfaction and confidence obtained high scores. Therefore, this learning method can used as an alternative to learning and support student skills and knowledge in another nursing skills.

Keywords: Satisfaction, self-confidence,virtual reality simulation

Introduction

As the dynamics of the times and the sophistication of technology are increasingly updated. In the educational field, there is a renewal of learning methods. Virtual reality is a tool adapted to create a three-dimensional environment from computer simulations to make it look as real as possible with the help of certain equipment, so that users feel a very strong sensation and feeling of being involved in that environment (Puspitaningrum, Pujiastuti, & Lestari, 2019; Efendi, et al., 2021). The process of providing knowledge in the field of education is closely related to learning technology updates, because it can have a huge impact on student learning outcomes. However, this is inversely proportional to the situation faced by students in Indonesia, where there is still a lot of students who feel that educational methods provided do not affect their learning outcomes. This is a result of the lack of interest in the concept of teaching which in turn causes a decrease in motivation and student learning outcomes. Low motivation to learn and increased boredom affect their learning outcomes. These problems are due to the impact of Covid-19 pandemic (Baseran, 2013; Menik, 2020). In the research of Samir Abou El-Seoud et al (2014) said that the improvement of learning outcomes, tenacity, and creativity of students is the result of motivated students so that they tend to do challenging activities, be more active, and enjoy the learning process more.

The practicum process in laboratory learning that was hampered ultimately requires an alternative solution so that the process of transferring skills can still take place without reducing the essential provision of basic knowledge. The utilization of virtual and computer-based laboratories is something that is worth trying by considering the increasing speed of technology in the field of learning. This method was chosen so that students still feel the atmosphere and sensation of following an offline or face-to-face practicum so that the learning process, improving thinking skills, can benefit character building, strengthening literacy strategies, increasing competence, and enriching the curriculum continues. In addition, virtual laboratories are also relatively easier than conventional laboratories, and can reach many people in many places (Saraswati & Mertayasa, 2020). This is in line with the opinion of Oh and Bailenson's research (2018) which states that virtual technology can provide a sensation that is close to reality so that its utilization for skill transfer processes is very high such as practicum. Even in some cases it is mentioned that this virtual technology can cause false memories as if the user has done such a real thing.

Practicum activities are the main learning concept to train students skills in providing action to train students skills in critical thinking so that they can realize the theories that have been learned in books or other media. In addition, they are also trained to be able to provide a visual form of how to apply the actions that exist in the guidelines in textbooks, journals, and even other references to perform these actions. This is done to train concentration skills, can provide motor stimulation and analytical skills of students (Nugroho, 2021). Along with technological developments, practicum that supports students skillful abilities and critical thinking is not only done in physical laboratories but also requires stimulation through practicum in virtual laboratories based on Virtual Reality (Nersesian et al., 2019).

Efforts to increase students' interest in exploring knowledge, especially in their field of study, must be done by increasing the satisfaction and self-confidence of the students themselves. In the scope of health and nursing, now provides new innovations to provide teaching materials to students by using simulation methods. This simulation method is used to provide provisions for students in learning various clinical skills before they go directly to the field or clinical area in a more real field (Omer, 2016).

Virtual laboratory practice using virtual reality provides many conveniences and increases student learning outcomes. Because the use of physical laboratories that require expensive costs, ineffective and inefficient time, and limited space causes a decrease in learning levels and has implications for student satisfaction and confidence, especially nursing students who will practice directly in clinical areas (R Rahmatullah,

2020; AK Triatmaja et al, 2021).

Simulation is an innovative learning technique that emphasizes student center learning so that it can increase student motivation and activeness to achieve learning objectives, namely knowledge and skills in clinical situations (Faulcon, 2015). One of them is by trying to use VR in the learning process. Based on the results of research conducted by (Heldina, 2021) the use of VR in learning media has a success index of 86% which means that students understand the material provided and strongly agree on the use of VR.

Several other studies have also shown that the use of simulation methods in learning can provide improvements in clinical skills, satisfaction levels, and learner or student confidence (Cant & Cooper, 2017; Lubbers & Rossman, 2016). Therefore, researchers are interested in conducting research on the description of the level of satisfaction and self-confidence after using virtual reality simulations in nursing students.

Research Method

This research is a quantitative pre-experiment study with a One Group Post-Test design which was conducted in 26 December – 16 January 2022-2023. The design of this study aims to describe the use of virtual reality as a practicum learning simulation for nursing students. The population used in this study were Faculty of Nursing students in 2019, totaling 125 students. The sample was taken using the slovin formula 10% error tolerance percentage, and obtained 56 student samples. The sampling technique uses quota sampling to all nursing student samples determined by certain criteria, namely active students of the Faculty of Nursing class of 2019 and have completed the Medical-Surgical Nursing course (KMB), as well as active nursing students who are willing to participate in research until the desired quota is metSampling was carried out by distributing surveys to find out which students were willing and willing to carry out a simulation with the researchers, then scheduling was carried out to coordinate time in conducting research.

In collecting data using an instrument,

namely the Student Satisfaction and Self-Confidence in Learning Scale (SCSL) developed by The National League for Nursing (NLN) and translated into Indonesian. This questionnaire consists of 13 items, 5 of which are about satisfaction and 8 items are about self-confidence. Each question has 5 answer options with each value being strongly disagree (1), disagree (2), undecided (3), agree (4), and strongly agree (5). This study has a validity test, it was found that all question items were valid with r => 0.499. In the reliability test, the Cronbach Alpha value ranges from 0.795 (Fatih et al., 2019).

In this study 56 students have tried learning simulations using Virtual Reality Nursing which has 3 nursing action simulations. However, in this study students will be directed to simulate nursing actions, namely wound care. At the time of the study, students were directed to carry out the stages and instructions contained in the wound care action. After completing the learning, students will fill out a satisfaction and confidence questionnaire in the form of an online questionnaire..

The next stage is that students answer research statements, so that data can be collected to be analyzed by researchers and described in the form of frequency distribution tables, percentage results, average/mean results, and results from standard deviation. Data collection via google form which is then entered into excel to be grouped and data processed using SPSS. The statistical test used in this study is the univariate analysis test. All collected data will be processed using google spreadsheet to distribute demographic data and IBM SPSS version 26. After calculations, a significant value or p <0.1 with an Alpha of 0.1 or 10% is obtained which states that this research is significant.

In this study, it is based on a literature search that can be used as a basis for data processing so that the calculations will be appropriate and precise so as to avoid bias. Discussions and exchanging opinions are also prioritized in determining problems and data processing so that the data obtained is appropriate, specific, and precise. The collection and processing of data is appropriate so that no data is missing or inappropriate.

Ethical principles used in this study

include informed consent, anonymity, confidentiality, justice, and respect for beneficence and maleficence. This research was conducted at the Faculty of Nursing, Padjadjaran University. This research has received approval and ethical consideration from Padjadjaran University with number 1005/UN6.KEP/EC/2022.

Results

The results obtained in this study showed very high scores in the category of student satisfaction and self-confidence. The summary of learning value from virtual simulation can be seen in the demographic table, frequency distribution table, percentage of results, mean, and standard deviation to determine the success of using virtual reality simulation tools in learning methods and skills of nursing students at Padjadjaran University. The table is presented as follows:

Table. 1 Demographic Characteristics of Respondents (n=56)

Demographic Data	Results	Frequency	Percentage
Gender	Male	4	7.1%
	Female	39	92.9%
Age	19	3	5.4%
	20	5	8.9%
	21	32	57.1%
	22	16	28.6%
Experience using virtual reality	Yes	29	51.8%
	No	27	48.2%

Table 1 shows that almost all respondents were female (92.9%) with a small proportion of male respondents (7.1%). The age range of respondents is 19-22 years old and most respondents are 21 years old (57.1%) with a small proportion aged 19 years (5.4%). With a history of respondents' experience in using virtual reality, most respondents have used virtual reality simulations (51.8%) and most others (48.2%) have never used virtual reality simulations.
To find out the results of research on satisfaction levels, the values obtained from each respondent are presented in the form of a frequency distribution table as follows:

Table 2 Frequency distribution of student satisfaction level (n=56)

Category	Mean	Frequency	Percetage
Very Dissatisfied	1 – 1.79	0	0%
Not Satisfied	1.8 – 2.59	0	0%
Quite Satisfied	2.6 – 3.39	6	10,7%
Satisfied	3.4 – 4.19	16	28.6%
Very Satisfied	4.2 - 5	34	60.7%

Based on table 2, the results obtained were that most students were very satisfied in using virtual reality-based simulations, which means that this research was successful in providing learning success to students in understanding and carrying out laboratory practices with a focus on wound care skills.
Other results related to student confidence in performing wound care skills using virtual reality are presented in the following table:

Table 3 Frequency distribution of students' confidence level (n=56)

Category	Mean	Frequency	Percentage
Very Unconfident	1 – 1.79	0	0%
Not Confident	1.8 – 2.59	0	0%
Confident Enough	2.6 – 3.39	1	1.8%
Confident	3.4 – 4.19	20	35.7%
Very Confident	4.2 - 5	35	62.5%

Based on table 3, the research results showed that most students felt high self-confidence in conducting wound care laboratory practices using virtual reality.
The results of the study are then concluded in the results table to find out the interpretation of the research related to satisfaction and self-confidence as follows:

Table. 4 Students' level of satisfaction and confidence using the virtual reality (n=56)

Items	Mean	Std. Deviation	Interpretation
Satisfaction Level	4.400	0.670	Very Satisfaction
Self-Confident Level	4.357	0.622	Very Confident

Categorization: Very dissatisfied/confident (1.0 - 1.79); dissatisfied/confident (1.8 - 2.59); moderately satisfied/confident (2.6 - 3.39); satisfied/confident (3.4 - 4.19); very satisfied/confident (4.2 - 5.0) (Aldhafeeri & Alosaimi, 2020).

Table 4 shows that students are very satisfied (M = 4.400; SD = 0.670) and very confident (M = 4.357; SD = 0.622) in learning using virtual reality.

Discussion

In this study, which describes the level of satisfaction of Padjadjaran University Faculty of Nursing students in a very high range. It also means that the results are very satisfied with using the virtual reality in learningThe results obtained illustrate that the use of virtual reality in learning methods helps to increase the satisfaction and confidence of nursing students in performing nursing skills. Likewise, the results obtained in Fatih's research (2019) showed that there was a significant difference in the level of student satisfaction after and before using the simulation learning method. In line with previous research conducted by Alharbi (2022) which obtained research results that simulation is effective in increasing satisfaction and self-confidence of nursing students in preparing skills in hospitals (H Al Fatih et al, 2019; K Alharbi, 2022).

Meanwhile, according to Mystakidis (2022) in his research also argues, in addition to obtaining benefits in using VR, students also have the opportunity to get other disadvantages, namely the privacy data security system which is still often reported due to the activities of using this metaverse product which is still too broad and free, health and safety guarantees for VR users, physical well-being, opportunities for injury due to fatigue in the neck and head, to other physical symptoms such as nausea and dizziness. In addition, the disadvantage of virtual reality-based virtual laboratories is that in the process of making simulations it is necessary to use the VR programming language using coding which is quite time consuming and inefficient. The program installation process is also said to be quite difficult to do if the computer does not meet the minimum specifications of the program. In addition, in the final simulation that can be used are the tools contained in the instructions only while the tools in the virtual reality room dimensions only exist as displays or additional aesthetic components. In the implementation of the simulation, there are many obstacles including server bugs, power outages, and obstructed communication (Saifuli et al, 2017).

In the research conducted by this researcher, before simulating learning using virtual reality, each student who participates will be given an explanation first about the features, materials, nursing actions and

stages contained in the VNursLab virtual reality. Students are also accompanied by instructors, namely researchers, in carrying out simulation actions as the main preventive to prevent ineffective communication and errors in action.

The acquisition of the value of student self-confidence is in the range of 4,357 for the average value which can be described as a very high value so that the interpretation of the results of this study is that students feel very confident in taking action after using the VNursLab virtual reality simulation. This is supported by research from Tagwa Omer (2016) in states that the results obtained from his research in using simulations provide high self-confidence values so that they are in line with the research conducted by researchers.

A very high level of satisfaction and confidence in this study was obtained due to good coordination and careful preparation for conducting research. The students involved were given the opportunity to know and learn the actions that would be implemented in the research. A qualified understanding of the students and the instructor in providing direction is the main basis that must be fulfilled to produce learning success. In addition to learning success, student satisfaction and confidence will also increase.

Virtual Reality VNursLab provides an alternative solution to reduce the obstacles and shortcomings found in conventional laboratory practicum conducted face-to-face. Virtual simulations can be done repeatedly and by minimizing action errors made by students. So that virtual reality simulations can support students' critical thinking skills and abilities before going directly to carry out professions and actions to patients in clinical areas. This is beneficial for the continuity of education and skills at the Faculty of Nursing.

But in this study, there have obstacles from the research conducted by researchers. From the limited use of computers because only 2 computers are available that can be applied so that it makes research respondents take longer to rotate, if in a day there are 14 respondents simultaneously, the time to finish giving this simulation is very long and long. In addition, several times the server experienced interruptions so that the simulation was stuck and required time to repeat the simulation

from the beginning.

Conclusion

A high level of satisfaction and confidence is also very important for nursing students in providing nursing actions and care. High satisfaction and confidence support the achievement of learning success, far from that high satisfaction and confidence can affect the quality of nursing as well. The use of virtual reality in the field of nursing has been proven to provide high satisfaction and confidence in nursing skills. Using virtual reality in wound care skill nursing actions provides significant results on the level of satisfaction and confidence of students at the Faculty of Nursing Padjadjaran University.

While the evaluation in this study is related to the use of virtual reality which requires careful preparation. Where procedures for using the Virtual Laboratory need to be taught so that students understand self-safety and laboratory security. Starting from the preparation to enter the laboratory, preparation of tools, use of tools, and maintenance of shared laboratory facilities. This is done to reduce the occurrence of injuries and accidents in the use of virtual laboratories.

Although in this study the obstacles and drawbacks of using virtual reality were minimal and could be overcome. However, it would be better for further research that the preparation and procedures for use for participants were carried out in a more mature and structured manner. This includes scheduling simulations so that they are more coordinated, because it will make it easier for researchers to provide a minimum and maximum time to conduct research.

The interesting thing about this research is that many students are very interested in and enjoy the process of using simulation tools. Even though there are deficiencies and obstacles in the use of the tool, it does not reduce the essence of research where communication and interaction go both ways. The obstacles and shortcomings of this study are solely the result of the experience of students in using virtual reality, which requires students to adapt to relatively new technology.

Therefore, for further research it is

hoped that the matters discussed above can be fulfilled according to the criteria and suggestions that have been given by the researcher, and can update research methods and techniques in accordance with the times so that the research conducted remains relevant.

References

Aldhafeeri, F., & Alosaimi, D. N. (2020). Perception of Satisfaction and Self-Confidence with High Fidelity Simulation Among Nursing Students in Government Universities. *Journal of Education and Practice*, 11(11), 137–149. https://doi.org/10.7176/jep/11-12-16

Alharbi, K., & Alharbi, M. F. (2022). Nursing Students' Satisfaction and Self-Confidence Levels After Their Simulation Experience. *SAGE Open Nursing*, 8, 23779608221139080.

Al Fatih, H., & Rahmidar, L. (2019). Kepuasan dan Kepercayaan Diri Mahasiswa Keperawatan Terhadap Penggunaan Low Fidelity Simulator Dalam Simulasi Bantuan Hidup Dasar. *Jurnal Keperawatan BSI*, 7(2), 153-160.

Bias C. G. S., Agostinho, L. S., Coutinho, R. P., & Barbosa, G. de S. (2016). Simulation in emergency nursing education: An integrative review. *Journal of Nursing Education and Practice*, 6(12), 12–17. https://doi.org/10.5430/jnep.v6n12p1

Cant, R. P., & Cooper, S. J. (2017). Use of simulation-based learning in undergraduate nurse education: An umbrella systematic review. *Nurse Education Today* 49, 63-71.

Carolina, I., Supriyatna, A., & Puspitasari, D. (2020, July). Analisa Tingkat Kepuasan Mahasiswa Terhadap Perkuliahan Daring Pada Era Pandemi Covid 19. In Prosiding *Seminar Nasional Riset Information Science (SENARIS)* (Vol. 2, pp. 342-347).

Cummings, C. L., & Connelly, L. K. (2016). Can nursing students' confidence levels increase with repeated simulation activities? *Nurse education today* 36, 419-421.

Faulcon, R. Y. (2015). Innovative Teaching Strategies with Simulation Technology in Nursing Education. *Voices in Education*, 1, 47–50. Retrieved from https://www.college.bm/images/documents/bcj/Vol_1/Innovative_Strategies_with_Simulation_Technology_in_Nursing_Education.pdf

Franklin, A. E., Burns, P., & Lee, C. S. (2014). Psychometric testing on the NLN Student Satisfaction and Self-Confidence in Learning, Simulation Design Scale, and Educational Practices Questionnaire using a sample of pre-licensure novice nurses. *Nurse Education Today*, 34(10), 1298-1304.

Galaresa, A. V., & Sundari, S. (2019). Penggunaan Metode Simulasi dalam Peningkatan Critical Thinking: Literature Review. *Jurnal Penelitian Keperawatan*, 5(1).

Hidayat, A. A. A. (2011). *Metode penelitian keperawatan dan teknik analisis data*.

Istiqomah, S. F., Sudaryanto, A., & Ners, M. K. (2022). *Praktek Laboratorium Keperawatan Dasar Dengan Menggunakan Virtual Reality Untuk Pendidikan Keperawatan:* Kajian Pustaka (Doctoral dissertation, Universitas Muhammadiyah Surakarta).

Lolang, E. (2014). Hipotesis Nol dan Hipotesis Alternatif. *Jurnal Keguruan Dan Ilmu Pendidikan*, 3(3), 685-695.

Martins, J. C. A., Baptista, R. C. N., Coutinho, V. R. D., Mazzo, A., Rodrigues, M. A., & Mendes, I. A. C. (2014). Self-confidence for emergency intervention: adaptation and cultural validation of the self-confidence scale in nursing students. *Revista latino-americana de enfermagem*, 22(4), 554-561.

National League for Nursing. (2005). Student Satisfaction and Self-Confidence in Learning. Retrieved from http://www.nln.org/docs/default-source/default-document-

library/instrument-2_satisfaction-and-self-confidence-in-learning.pdf?sfvrsn=0

Nersesian, E., Spryszynski, A., & Lee, M. J. (2019, March). Integration of virtual reality in secondary STEM education. In 2019 *IEEE Integrated STEM Education Conference (ISEC)* (pp. 83-90). IEEE.

Nugroho, A. (2021). Efektifitas laboratorium virtual dalam pembelajaran praktikum analisis farmasi pada mahasiswa farmasi saat pandemic covid-19. Refleksi Pembelajaran Inovatif.

Omer, T. (2016). Nursing students' perceptions of satisfaction and self-confidence with clinical simulation experience. *Journal of Education and Practice,* 7(5), 131–138. https://doi.org/10.13140/RG.2.1.2104.2800

Patmawati, T. A., Saleh, A., & Syahrul, S. (2018). Efektifitas metode pembelajaran klinik terhadap kemampuan berpikir kritis dan self-confidence mahasiswa keperawatan: A literature review. *Jurnal Keperawatan Muhammadiyah*, 3(2).

Rahmawati, D. (2013). Analisis Faktor-faktor yang Mempengaruhi kepuasan mahasiswa. *Jurnal Economia*, 9(1), 52-65.

Rachmatullah, R. (2020). Efektivitas Penggunaan Virtual Reality (VR) Dalam Pendidikan Keperawatan: Literature Review. *Jurnal Kesehatan*, 9(2), 11-21.

Samosir, Z. Z. (2005). Pengaruh kualitas pelayanan terhadap kepuasan mahasiswa menggunakan perpustakaan USU. *Jurnal Studi Perpustakaan dan Informasi*, 1(1).

Setiowati, A. (2014). Peningkatan Rasa Percaya Diri Mahasiswa Melalui Teknik Permainan (Studi pada Mata Kuliah Bimbingan dan Konseling Kelompok). Universitas PGRI Yogyakarta, 1-18.

Sofi'ah, S., Sugianto, S., & Sugiyanto, S. (2017). Pengembangan Laboratorium Virtual Berbasis VRML (Virtual Reality Modelling Language) Pada Materi Teori Kinetik Gas. UPEJ Unnes *Physics Education Journal*, 6(1), 82-90.

Triatmaja, A. K., Muchlas, M., & Wardana, Y. (2021). Virtual Laboratorium Teknik Digital berbasis Mobile Virtual Reality. *Jurnal Edukasi Elektro*, 5(1), 1-13.

Van Loon, A., Bailenson, J., Zaki, J., Bostick, J., & Willer, R. (2018). Virtual reality perspective-taking increases cognitive empathy for specific others. *PloS one*, 13(8), e0202442.

Veronika, N., Sugiarti, R., & Erlangga, E. (2021). Kepercayaan Diri (Self Confidence) Mahasiswa Cerdas Istimewa pada Pembelajaran Klinik. Syntax Literate; *Jurnal Ilmiah Indonesia*, 6(4), 1897-1914.

Widiasih, R., Komariah, M., Pramukti, I., Susanti, R. D., Agustina, H. S., Arifin, H. & Nelson, K. (2022). VNursLab 3D Simulator: A Web-Based Nursing Skills Simulation of Knowledge of Nursing Skill, Satisfaction, and Self-Confidence among Nursing Students. *Sustainability*, 14(9), 4882.