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Research Article

**EFFECTIVENESS OF DEMONSTRATION TECHNIQUE FOR  
LONG-TERM ABILITY TO PERFORM PROCEDURAL  
CLINICAL SKILLS AMONG NURSING STUDENTS**Marry Grace<sup>1</sup>, Sehrish Imtiaz<sup>2</sup><sup>1,2</sup> Register Nurse, Shaikh Zayed Hospital, Lahore**Article Received:** December 2021 **Accepted:** January 2022 **Published:** February 2022**Abstract:**

**Background:** Teachers usually adopt standard methods of teaching including lecture, recitation, and laboratory to educate collaborative problem-solving, critical thinking and creative thinking. Despite advances in technology employers complain that today's college graduates are sternly deficient in basic skills mainly communication, problem-solving, the ability to prioritize tasks and decision making. The poor performance of students in nursing education may be ascribed to poor teaching strategies and skills. The purpose of this study is to check the effects of two different teaching methods within a simulated setting on the long-term performance of postgraduate nursing students: including lecture-based learning vs. demonstration-based learning in skills lab.

**Material and Methods:** A quasi-experimental two group design was used in this study. The study was conducted on 100 postgraduate nursing students in a private university of Lahore, Pakistan through convenience sampling technique. The data was collected with the help of structured questionnaire. The students of first semester of master of sciences in nursing were selected for study. Normality test and independent t test were applied for the analysis comparison of two groups.

**Results:** This study prospectively investigated the long-term retention of two different skills taught in two different ways. Students with demonstration-based learning scored significantly higher immediately after training than lecture-based learning. In addition, demonstration-based teaching students were more often rated clinically competent at all assessment times.

**Conclusion:** This study shows that within a simulated setting demonstration-based learning is significantly more effective than traditional lecture-based learning assessed immediately after training and at follow-up. The advantages of demonstration-based training are seen especially in long-term retention.

**Key Words:** Demonstration based learning; Lecture based learning, Problem solving, Teaching strategies

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## INTRODUCTION:

Teachers usually adopt standard methods of teaching including lecture, recitation, and laboratory to educate collaborative problem-solving, critical thinking and creative thinking (Giridharan & Raju, 2016). They often instruct certain topic to the students so that they learn good knowledge. Despite advances in technology employers complain that today's college graduates are sternly deficient in basic skills mainly communication, problem-solving, the ability to prioritize tasks and decision making (Ogwo & Oranu, 2006). The poor performance of students in nursing education may be ascribed to poor teaching strategies and skills. . Appropriate teaching strategies can improve learning and skills acquisition. Inquiry, discussion, lecture and demonstration are some teaching strategies that help in organizing people, materials and ideas to provide learning (AKPAN). The purpose of this study is to check the effects of two different teaching methods within a simulated setting on the long-term performance of postgraduate nursing students: including lecture based learning vs. demonstration based learning in skills lab. I choose lecture based and demonstration based teaching strategies in large classroom of master of sciences and these should be used in Pakistan to fulfill the gap between theory and practice.

Lecture based strategy encompasses a verbal demonstration of facts, ideas, theories and oversimplifications. The exercise of this technique is that of spoon-feeding the learners with facts or information. The students stay inactive and obtain information from their teacher (Hanushek & Rivkin, 2006). In contrast demonstration based strategy is the teaching of concepts, principles of real things by combining explanation with control or influence of real things, materials or equipment (Akinbobola & Ikitde, 2011). The demonstration strategy is effective for long-term memory retaining and suitable to college students' study skills (McCabe, 2014).

The skills lab is a well-known part of a medical faculties that offers a protected, "mistake forgiving" training environment for demonstration (Ziv, Ben-David, & Ziv, 2005) and allows students to practice procedures on standardized patients or with each other prior to performing procedural skills on real patients (Barrows, 1993). Skills lab facilitates the safe practices to improve the procedural skills (Issenberg *et al.*, 1999). Nursing students apply these skills in clinical setting to improve the quality of life. In addition simulation-based medical education (SBME) positively influences the outcome in the clinical setting (McGaghie, Draycott, Dunn, Lopez, & Stefanidis, 2011)

In a systematic review, Issenberg and colleagues label aspects that influence the usefulness of simulation based medical education (Labarrere *et al.*, 2011). The key factor including "thoughtful practice", "assimilation into curriculum" and "strength of simulators" subsidize to the significant success of demonstration based learning. Demonstrations provide a multi-sensory means to describe a concept, idea, or product that may otherwise be difficult to grasp by verbal description alone (Giridharan & Raju, 2016). Ogwo and Oranu (2006) insist that demonstration strategy is the most commonly used Teaching Strategy for gaining of practical skills as it verbalize and practically perform the given procedure. Cabibihan (2013) used working models for in-class demonstrations and reported that worldwide student spectators had answered favorably to the in-class demonstrations. However, not much is known about the long-term retention of procedural skills acquired during demonstration, although practical competences are known to subside over time, if they are not repeatedly practiced (Arthur Jr, Bennett Jr, Stanush, & McNelly, 1998).

Overall, theoretical knowledge looks to be remembered better than practical skills, and the presentation of simpler tasks appears to be lost more slowly than complex ones (Bonrath *et al.*, 2012). The bulk of studies looking at the long-term retaining of technical skills focus on techniques in basic and innovative cardiac life support drill. Reports in the literature show that the teachers' guidance ominously contribute to students' theoretical achievement (Hanushek and Rivkin 2006; Adams *et al.* 2009; Kini and Podolsky 2016). It was found by the author, that the 2340wevetiveness of teachers was suggestively related to student achievement in reading and math. (Podolsky, Kini, & Darling-Hammond, 2019) found that the teachers with more experience influence their students not only in academic achievement, also in their class attendance. The 2340however234eess and retention of skills taught in have been studied less, with regards to performed skills, study subjects and teaching methods, rendering data interpretation difficult.

It is evident from the above discussion that demonstration-based Teaching Strategy has the significant influence on students' accomplishment. Demonstrations provide the multisensory approach to teaching through practical hands-on learning using working models. It is also evident that a large body of education literature reveals positive impact of Teacher Effect on student achievement. However, there is certainly a dearth of information available in literature on the combined and interactive effect of

Teaching Strategy and Teacher Effect on students' achievement. Hence, this study became necessary to determine the effects of Teaching Strategy and Teacher Effect on students' academic performance in nursing education. In summary, our current understanding of factors contributing to long-term retention of skills is still limited owing to general data shortage, flaws in study design and heterogeneity in tested skills with regards to their complexity. Within a demonstration-based setting, different teaching components comprise the "best practice" skills lab training. In this respect, it was implemented as standard instruction for resuscitation courses of the European Resuscitation Council (Johansson, Annerud, Jensen, & Lassen, 2012). There is conflicting evidence whether skills lab teaching following a demonstration based teaching leads to a better performance than other established teaching methods, for example a more traditional lecture based teaching (Marušić & Marušić, 2004). In this form of teaching, students learn by merely watching an experienced doctor explaining and demonstrating the skill (O'Baugh, Wilkes, Sneesby, & George, 2009). The expert acts as a role model and the first independent performance of procedural clinical skills is already with a real patient. Two recent studies could show that skills lab training following a demonstration with structured individual feedback, practice on manikins and Peyton's "Four Step-Approach" is superior to traditional lecture based teaching (Lund et al., 2012). However, these findings are solely based on performance assessments immediately after the respective teaching, and research comparing long-term effects is still lacking. To our knowledge, so far there has been no randomized and prospective study investigating the effect of two different teaching approaches for postgraduate nursing students for skills of different complexity with regards to long-term outcomes. We therefore investigated the effects of two different teaching methods within a simulated setting on the long-term performance of postgraduate nursing students: a "demonstration" vs. a traditional "lecture based".

### Objective

The objective of the research study was to determine if traditional lecture results higher in MSN first year students than demonstration.

### Hypothesis

H10: There are differences between demonstration education and traditional lecture based education in-classroom education.

H1a: There are differences between demonstration education and traditional lecture based education in-classroom education.

### Conceptual frameworks

As conceptual frameworks for the learning content we used standard up-to-date manuals, which have been used regularly in our classes as well as for our previous studies (Stroud, Duncan, & Nightingale, 2003). Regarding the conceptual frameworks for methods, the current study was based on Ericsson's model of deliberate practice with feedback as the basis of our skills lab training, and Bandura's social learning theory as basis for the traditional bedside teaching (Harper, Leff, Thomas, & Burton, 2004)

## MATERIALS AND METHODS:

### Study Design

A quasi-experimental design was used in this study. A convenience sample of 100 MSN first-year nursing students was recruited from the health sciences areas of two universities. At the time of this study, students were enrolled in the Advance Concepts in Health Assessment course during the spring semester of the academic year 2019–2020. Students were divided into two experimental group. One experimental group received demonstration-based learning while the other experimental group received traditional lecture based classroom learning. Five students who had continuous absenteeism and 18 students taking the course again due to failure were not included in the study. In addition, five students who had graduated from vocational health school and transferred vertically to higher education were excluded due to their previous urinary catheterization knowledge and skills.

All teaching took place within the skills lab of the nursing faculty of a private university of Lahore, Punjab Pakistan. This was done to make the teaching conditions as comparable as possible and to control for a maximum of possible confounders. At any given time, only one method (Demonstration or Traditional Lecture) was taught to avoid cross contamination. In total, 8 teachers ran the training sessions. All teachers were experienced student tutors of our skills lab whose equality in teaching performance as compared to faculty.

Study was completed in 15 weeks from September 17, 2019 to January 7, 2020. A convenient sample of 100 students was taken from MSN first year students who enrolled the "Advance Concepts in Health Assessment" subject. Non probability, convenient sampling technique was used to collect the data from MSN first year students. MSN and BSN students of a

private university of Lahore, Punjab Pakistan and who were enrolled in this subject first time were selected for this study. Students who were failed in the previous semester and again enrolled the “Advance Concepts in Health Assessment” were excluded. Five students who were continue absent were also excluded from the study.

A structured questionnaire was used to collect the data from both groups. The questionnaire was comprised on three parts. The first part consists of consent form and brief summary about the confidentiality of responses and request the participants to complete the questionnaire honestly. The second part collected information related to respondents’ demographic profile and with statement of gratitude. Whereas, the third part contain question item related to our variables of interest i.e. teaching methods. The measures of all research constructs were adopted from prior literature. Best teaching method was assessed using five items Likert scale.

A structured questionnaire was used to collect the data from students. The measure of the research construct was adopted from prior literature. Before the teaching session, we recorded socioeconomic and educational background data to ensure that there were no confounders among the two groups. In addition, the students’ general learning strategies were characterized by standardized questionnaires: The Kolb Learning Style Inventory (LSI) (Corbett & Whitcomb, 2004). The Kolb Learning Style Inventory aims to define an individual’s specific learning preference. It consists of 12 items ranked on a five-point Likert scale (5 = strongly agree to 1= strongly disagree).

The two intervention groups (lecture: n=50 and demonstration: n=50) trained both in the skills laboratory using structured individual feedback, performance on manikins and Peyton’s “Four-Step-Approach” (Krautter et al., 2011) which consists of

the following four steps: 1. The teacher demonstrates the skill at his normal speed without any comments (“Demonstration”). 2. The teacher repeats the procedure, this time describing all necessary sub-steps (“Deconstruction”). 3. The student has to explain each sub-step with the teacher following the student’s instructions (“Comprehension”). 4. The student performs the complete skill on his own (“Performance”). Each student was allowed to perform step 4 once for each skill. Each session was held in a group of three students with one teacher. Both skill trainings were embedded into a clinical scenario with role-play to create a more realistic training situation and to enhance the students’ involvement (Cassar, 2004). Afterwards, students received feedback about their performance.

After the teaching sessions, we immediately videotaped the students’ performance at two assessment station on the same mannequins as used in training comparable to the ones used in OSCEs (Objective Structured Clinical Examination). Each student was alone in the assessment room and had only one attempt to perform the skill learned. The other students from the corresponding teaching group waited in a different room with a supervisor present until it was their respective turn for individual assessment. The total amount of time needed was recorded for each skill at both assessments dates. There was an assistant present to take care of any students who arrived before their allocated assessment time. Again, students were videotaped to be rated by video assessors via the identical checklists. All students signed an agreement not to talk to their fellow students about their experienced teaching method and not to practice the skills in between assessment date.

## RESULTS:

This section represents the distribution of the students by demographic characteristics. The data is summarized in terms of frequency and percentage.

**Table no 1: Demographic Characteristics of Study Participants**

Demographic Information	Groups	Frequency	Percent (%)
Gender	Male	43	42.6%
	Female	57	57%
	Total	100	100%
Age Group	25-30 Year	12	11.9%
	31-35 Year	88	87.1%
	Total	100	100%

**Table No 2: Lecture Based Teaching**

S#	Question	Strongly Disagree F (%)	Disagree F (%)	Neutral F (%)	Agree F (%)	Strongly Agree F (%)
1	I received good quality teaching.	0	0	0	7 (14)	43 (86)
2	I received a good quality of induction.	0	0	0	9 (18)	41 (82)
3	I received good quality assignment support.	0	0	0	14 (28)	36 (72)
4	I found the module handbook helpful.	0	0	3 (6)	12 (24)	35 (70)
5	I had access to relevant textbooks.	0	0	0	9 (18)	41 (82)
6	I received a good quality of e-learning materials.	0	0	0	15 (30)	35 (70)
7	I found the email support from tutors helpful.	0	0	1(2)	14 (28)	35 (70)
8	I found the assignment instructions helpful.	0	0	0	9 (18)	41 (82)
9	I prefer to learn in face-to-face situations.	0	0	0	15 (30)	35 (70)
10	I prefer to learn through communicating with others using technology.	0	2(4)	4 (8)	26 (52)	18 (36)
11	I prefer to learn through communicating with others using technology.	0	0	0	6 (12)	44 (88)

**Table No 3: Demonstration Based Teaching**

S#	Question	Strongly Disagree F (%)	Disagree F (%)	Neutral F (%)	Agree F (%)	Strongly Agree F (%)
1	I received good quality teaching.	0	1(2)	10(20)	20 (40)	19 (36)
2	I received a good quality of induction.	0	3(6)	19(38)	22 (44)	6 (12)
3	I received good quality assignment support.	0	10(20)	18(36)	16 (32)	6 (12)
4	I found the module handbook helpful.	0	0	15(30)	26(52)	89(18)
5	I had access to relevant textbooks.	0	3(6)	19(38)	22 (44)	6 (12)
6	I received a good quality of e-learning materials.	0	10(20)	18(36)	16 (32)	6 (12)
7	I found the email support from tutors helpful.	0	0	21(42)	29(58)	0
8	I found the assignment instructions helpful.	0	2(4)	21(42)	22 (44)	5 (10)
9	I prefer to learn in face-to-face situations.	0	0	21(42)	24 (48)	5 (10)
10	I prefer to learn through communicating with others using technology.	0	2(4)	5(10)	16 (32)	27 (54)
11	I prefer to learn through communicating with others using technology.	0	10(20)	18(36)	16 (32)	6 (12)

**Table No 4: Lecture & Demonstration Based Teaching Mean**

Group Statistics					
Group		N	Mean	Std. Deviation	Std. Error Mean
Mean	Lecture	50	3.69833	.409250	.057877
	Demonstration	50	4.70167	.175036	.024754

**Table No 5: Test of Normality**

		Kolmogorov-Smirnov			Shapiro-Wilk		
Group		Statistics	df	Sig.	Statistics	Df	Sig.
Mean	Lecture	.156	100	.000	.919	100	.000
	Demonstration	.156	100	.000	.919	100	.000

**Table No 6: Independent Sample test**

Mean		Levene's Test for Equality of Variances		T	Df	Sig. (2-tailed)	t-test for Equality of Means		95% Confidence Interval of the Difference	
		F	Sig.				Mean Difference	Std. Error Difference	Lower	Upper
	Equal variances assumed	24.463	.000	-15.939	98	.000	-1.003333	.062948	-1.128252	-.878415
	Equal variances not assumed			-15.939	66.346	.000	-1.003333	.062948	-1.129001	-.877666

Table 1 demonstrates the frequencies and percentage of demographic data. Table 2 and 3 shows frequency and percentage of the demonstration based learning and lecture based learning of nursing students. Table 4 depicts the mean of both groups. Table 5 shows the test of normality and showed that the data is normal distributed. Table 6 depicts the independent t test. The result shows that the study is significant and both methods are significant.

### DISCUSSION:

This study prospectively investigated the long-term retention of two different skills taught in two different ways ("lecture" skills lab training and a "demonstration" approach) to first year MS Nursing students. Students were carefully selected according to in- and exclusion criteria and randomized to one of the four groups. There were no significant differences in socioeconomic background and other potentially influencing variables among the four different study cohorts. To our knowledge, the long-term retention of skills taught to nursing students comparing a "lecture" model of skills lab training and a "demonstration" approach as frequently used in clinical bedside teaching has not been investigated so far. Most of the research contrasting simulation-based medical education (SBME) and traditional teaching methods to date has focused on residents, and was

either concerned with complex surgical or intensive care procedures

### CONCLUSION:

In summary, we could show that a best practice skills lab training based on demonstration is superior to the traditional lecture based approach. This observed superiority applies for single steps of the procedures, time needed to perform the skills, and the global clinical impression. With regards to the long-term performance, skills lab teaching seems to be particularly helpful for the reproduction of easier skills. This observed superiority applies for single steps of the procedures, time needed to perform the skills, and the global clinical impression. With regards to the long-term performance, skills lab teaching seems to be particularly helpful for the reproduction of easier skills.

In line with previous studies that showed superiority of skills lab training immediately after teaching and in transfer to real patients for the two skills (Lund F et al. 2012) this study underlines the importance of skills lab training being an integral part of teaching students with respect to long-term performance. Further studies should investigate whether these findings hold up when transferred to real patients. Additionally, research in this field should focus on clarification studies as suggested by Cook et al., asking for how and why skills lab training seems to be so superior to the traditional “see one, do one” training provided by bedside teaching (Cook DA., Bordage G., Schmidt HG 2008)

### LIMITATIONS

Several limitations of our study should be mentioned.

- As the study was done on a voluntary basis, there is of course the possibility of a selection bias with only the very motivated students showing up. However, there were a lot more students registering in the first place that had to be excluded due to exclusion criteria or time incompatibilities.
- Furthermore, we cannot exclude that some students practiced the tasks on their own, although all students signed an agreement not to do so and additionally gave oral confirmation on their second testing day about it. In any case, it is very unlikely that they had a structured training in the meantime.
- Another limitation is the fact that all teaching took place in a simulated environment. This limits the generalizability of our findings with regards to clinical context.
- Additionally, students taught within the skills lab could practice each skill one time before doing the actual test in the assessment stations as opposed to bedside teaching students who had only seen someone else performing the task.

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### REFERENCES:

1. Akinbobola, A., & Ikitde, G. (2011). Strategies for teaching mineral resources to Nigeria secondary school science students. *African Journal of Social Research and Development*, 3(2), 130-138.
2. AKPAN, u. t. instructional strategies and students'academic performance in electrical installation in technical colleges in akwa ibom state.
3. Arthur Jr, W., Bennett Jr, W., Stanush, P. L., & McNelly, T. L. (1998). Factors that influence skill decay and retention: A quantitative review and analysis. *Human performance*, 11(1), 57-101.
4. Barrows, H. S. (1993). An overview of the uses of standardized patients for teaching and evaluating clinical skills. *Academic Medicine-Philadelphia-*, 68, 443-443.
5. Bonrath, E. M., Weber, B. K., Fritz, M., Mees, S. T., Wolters, H. H., Senninger, N., & Rijcken, E. (2012). Laparoscopic simulation training: testing for skill acquisition and retention. *Surgery*, 152(1), 12-20.
6. Cassar, K. (2004). Development of an instrument to measure the surgical operating theatre learning environment as perceived by basic surgical trainees. *Medical teacher*, 26(3), 260-264.
7. Corbett, E., & Whitcomb, M. (2004). The AAMC project on the clinical education of medical students: clinical skills education. *Washington, DC: Association of American Medical Colleges*.
8. Giridharan, K., & Raju, R. (2016). Impact of teaching strategies: demonstration and lecture strategies and impact of teacher effect on academic achievement in engineering education. *International Journal of Educational Sciences*, 14(3), 174-186.
9. Hanushek, E. A., & Rivkin, S. G. (2006). Teacher quality. *Handbook of the Economics of Education*, 2, 1051-1078.
10. Harper, G. M., Leff, B., Thomas, P., & Burton, J. (2004). Johns Hopkins University School of Medicine. *Academic Medicine*, 79(7), S70-S71.
11. Issenberg, S. B., McGaghie, W. C., Hart, I. R., Mayer, J. W., Felner, J. M., Petrusa, E. R., . . . Gessner, I. H. (1999). Simulation technology for health care professional skills training and assessment. *Jama*, 282(9), 861-866.
12. Johansson, F., Annerud, C., Jensen, O. N., & Lassen, A. (2012). Patients arriving by ambulance to the Emergency Department; vital signs and 30 day mortality. *Scandinavian journal of trauma, resuscitation and emergency medicine*, 20(S2), P37.
13. Krautter, M., Weyrich, P., Schultz, J.-H., Buss, S. J., Maatouk, I., Jünger, J., & Nikendei, C. (2011). Effects of Peyton's four-step approach on objective performance measures in technical

- skills training: a controlled trial. *Teaching and learning in medicine*, 23(3), 244-250.
14. Labarrere, C. A., Woods, J., Hardin, J., Campana, G., Ortiz, M., Jaeger, B., . . . Cosgrove, S. (2011). Early prediction of cardiac allograft vasculopathy and heart transplant failure. *American Journal of Transplantation*, 11(3), 528-535.
  15. Lund, F., Schultz, J.-H., Maatouk, I., Krautter, M., Möltner, A., Werner, A., . . . Nikendei, C. (2012). Effectiveness of IV cannulation skills laboratory training and its transfer into clinical practice: a randomized, controlled trial. *PloS one*, 7(3), e32831.
  16. Marušić, A., & Marušić, M. (2004). Clinical teaching in a time of war. *The Clinical Teacher*, 1(1), 19-22.
  17. McCabe, J. A. (2014). Learning and Memory Strategy Demonstrations for the Psychology Classroom.
  18. McGaghie, W. C., Draycott, T. J., Dunn, W. F., Lopez, C. M., & Stefanidis, D. (2011). Evaluating the impact of simulation on translational patient outcomes. *Simulation in healthcare: journal of the Society for Simulation in Healthcare*, 6(Suppl), S42.
  19. O'Baugh, J., Wilkes, L. M., Sneesby, K., & George, A. (2009). Investigation into the communication that takes place between nurses and patients during chemotherapy. *Journal of psychosocial oncology*, 27(4), 396-414.
  20. Ogwo, B., & Oranu, R. (2006). Methodology in formal and non-formal technical/vocational education. *Nsukka: University of Nigeria Press Ltd.*
  21. Podolsky, A., Kini, T., & Darling-Hammond, L. (2019). Does teaching experience increase teacher effectiveness? A review of US research. *Journal of Professional Capital and Community*.
  22. Stroud, M., Duncan, H., & Nightingale, J. (2003). Guidelines for enteral feeding in adult hospital patients. *Gut*, 52(suppl 7), vii1-vii12.
  23. Ziv, A., Ben-David, S., & Ziv, M. (2005). Simulation based medical education: an opportunity to learn from errors. *Medical teacher*, 27(3), 193-199.