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Abstract

Can we teach problem solving in a clinical nursing laboratory? Elfi Ashcroft Technical Officer & Nursing Laboratory Manager University of Wollongong Abstract: The objectives of clinical nursing laboratories are the acquisition of psychomotor skills and the simulation of realistic clinical situations (Reilly and Oerman, 1992). A successful educational experience should also encourage the student to identify their development needs and initiate their own learning response (Neary, 2000). Laboratory classes are congested with factual information and demonstration (show and tell). Students, however, rarely have enough time to explore equipment and to acquire technical problem solving skills. The idea to develop a laboratory session that differed from the usual approach within the department emerged from the laboratory manager's concern for how little skill students initially acquired and ultimately retained when confronted with multiple, complex psychomotor skills and the use of technical equipment. Lecturers supported the development of a different teaching approach and the nursing laboratory manager designed a clinical laboratory session that prompted self directed learning and concentrated on problem solving and critical thinking processes within a simulated clinical scenario. The content was selected to actively encourage second year nursing students to combine psychomotor skills with cognitive skills to solve a given problem. Team working, time management and communication issues were incorporated to achieve a meaningful and challenging scenario. Keywords: clinical nursing laboratory, problem solving, critical thinking

Keywords

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Can we "teach" problem solving in a clinical nursing laboratory?

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Abstract:

The objectives of clinical nursing laboratories are the acquisition of psychomotor skills and the simulation of realistic clinical situations (Reilly and Oerman, 1992). A successful educational experience should also encourage the student to identify their development needs and initiate their own learning response (Neary, 2000).

Laboratory classes are congested with factual information and demonstration ("show and tell"). Students, however, rarely have enough time to explore equipment and to acquire technical problem solving skills. The idea to develop a laboratory session that differed from the usual approach within the department emerged from the laboratory manager's concern for how little skill students initially acquired and ultimately retained when confronted with multiple, complex psychomotor skills and the use of technical equipment.

Lecturers supported the development of a different teaching approach and the nursing laboratory manager designed a clinical laboratory session that prompted self directed learning and concentrated on problem solving and critical thinking processes within a simulated clinical scenario.

The content was selected to actively encourage second year nursing students to combine psychomotor skills with cognitive skills to solve a given problem. Team working, time management and communication issues were incorporated to achieve a meaningful and challenging scenario.

Keywords: clinical nursing laboratory, problem solving, critical thinking

Introduction and method:

According to the concept of andragogy (Hinchcliff, 1992), adult learners reject learning experiences that are not satisfying. Hence, if the faculty provides a process in which the individual student is allowed to take the initiative and be in charge of their own skill development, learning by experience can take over from learning by instruction.

There was initially no intention to formally evaluate this session. However, the tutors perceived success that contrasted strongly with some verbal criticism received from students in the initial feedback phase. This ambiguity made a retrospective evaluation worthwhile. To the author's knowledge, no data exists that allows comparison between the usual approach and the presented method in teaching the

operation of intravenous infusion devices. The author therefore chose to distribute a questionnaire in following laboratory sessions. One group had to be evaluated immediately after the end of the feedback session due to the need to move the lab from the original schedule. The questions allowed the students to grade satisfaction, but most importantly to voice their opinion. The time delay between the exercise and the evaluation allowed time for reflection.

The evaluation of the presented approach was based on a two-hour laboratory session for second year Bachelor of Nursing students. The exercise was repeated with five groups of 20 to 24 participants. The students were randomly allocated to teams and were assigned to eight stations featuring:

- An electronic infusion device
- Appropriate instruction booklet
- A fluid prescription or medication chart
- A simulated patient (two paediatric) with an intra venous access in situ

A simulated room that provided all necessary consumables, simulated medications, medical-surgical nursing textbooks, medical dictionaries and several copies of MIMS was made available. Additionally, all teams received an overhead transparency and a suitable pen to record their approach to the problem solving process for later discussion.

None of the electronic infusion devices had been discussed in previous laboratory classes. All other required skills, such as priming intra venous lines and giving intravenous injections, as well as factual knowledge, had been addressed at some point in the course before this laboratory.

The students received 15 to 20 minutes verbal introduction and one page of written instructions explaining the nature of the exercise. This gave them cues as to how to address the challenge. The students were instructed to only interact with other members of their team. The tutors' role was to give the introduction, to observe the practice and co-ordinate the feedback session. They were instructed not to interfere, nor to answer questions relating to the students' task. Each team was allowed 60 minutes to complete their task.

Evaluation:

Feedback:

The tutors and the students engaged in a 25minute feedback session immediately following the exercise comprising; overall student feed back, a brief presentation from each team and general remarks from the tutors.

- The tutors observed that teamwork was one of the achieved tasks across all groups. **Student: "It was good to have a partner to work with".**
- Students' work was focused and they concentrated on their topic. **Student: "Challenging and enjoyable, you learn from being put in the position of just having to do something".**
- In many cases the students appeared to have a sudden insight when they figured out a problem. **Student: "It was challenging but an interesting way to learn constructively".**

- Even though not prioritised in the introduction, a majority of teams reached the point of starting the infusion. However, some students remarked that they found it inappropriate to have to comprehend the equipment on their own with only the help of an instruction manual, without being formally instructed.
Student: "Would have preferred to know more about using the equipment. I felt that I wasted a lot of time trying to figure out how to work [it] rather than practising setting it up".
- Some remarked that the medication calculations were too difficult and requested: **"...harder drug calculations to prepare us"**.
- Some were critical of the point that the tutors were not answering questions relating to the task. **Student: "It was assumed that we knew how everything worked, because we were unable to ask for assistance, this I didn't like"**.
- One student summed it up as: **" I think it was good. Some people complained because they said we should have been taught everything first, but we can't obviously know everything when we start working on wards and we'll need to use problem solving skills like the ones we used in the lab when we come across something we haven't seen before."**

Questionnaire:

An evaluation form was distributed to the sample of 110 students. 79 questionnaires were returned. Questions 1 to 5 required the students to grade the following:

- The relevance of the laboratory content (Figure 1)
- The relevance of problem solving skills for their future careers in nursing (Figure 2)
- The method of delivery within the team problem solving approach (Figure 3)
- The materials and equipment available (Figure 4)
- The grade of difficulty students perceived personally (Figure 5)

Questions 1 to 4 offered additional space for comments. Question 6 was open-ended, asking the students to identify ways they would have prepared for the lab if they had known what was expected of them. Question 7 asked the students about their overall impression of the laboratory session.

The author analysed the data by separating the numeric quantifiers from the written quotes. The diagrams (Figures 1 to 5) show the responses to questions 1 to 5, as well as an indication of the variation between the 5 groups (± 1 standard deviation).

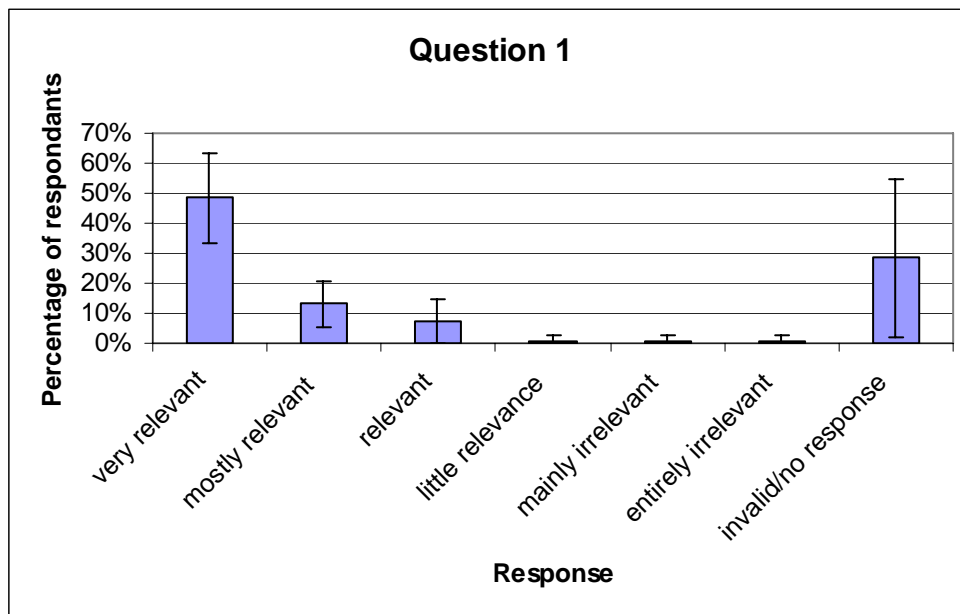


Figure 1: The relevance of the laboratory content

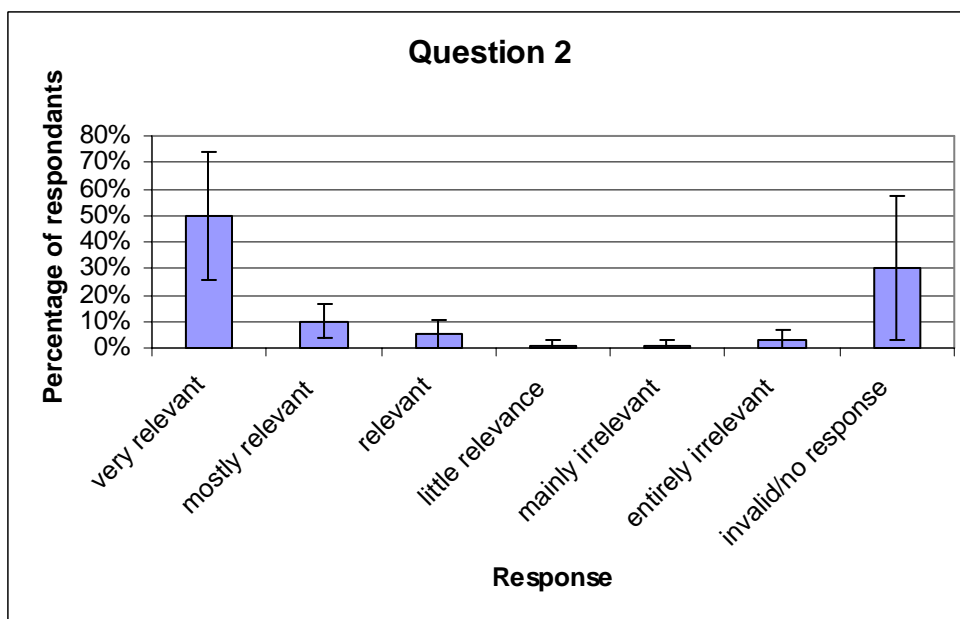


Figure 2: The relevance of problem solving skills for students' future careers in nursing

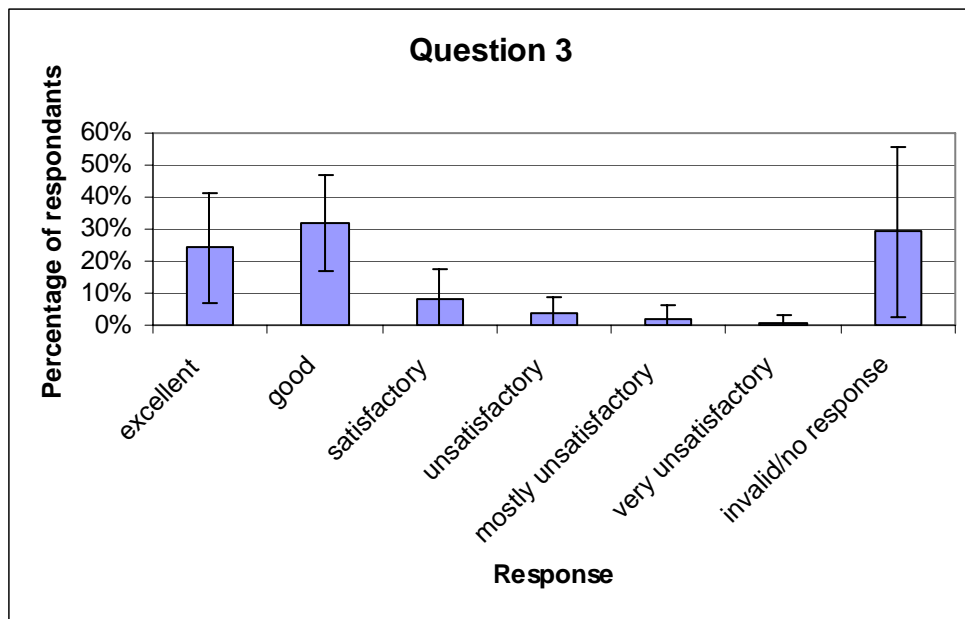


Figure 3: The method of delivery within the team problem solving approach

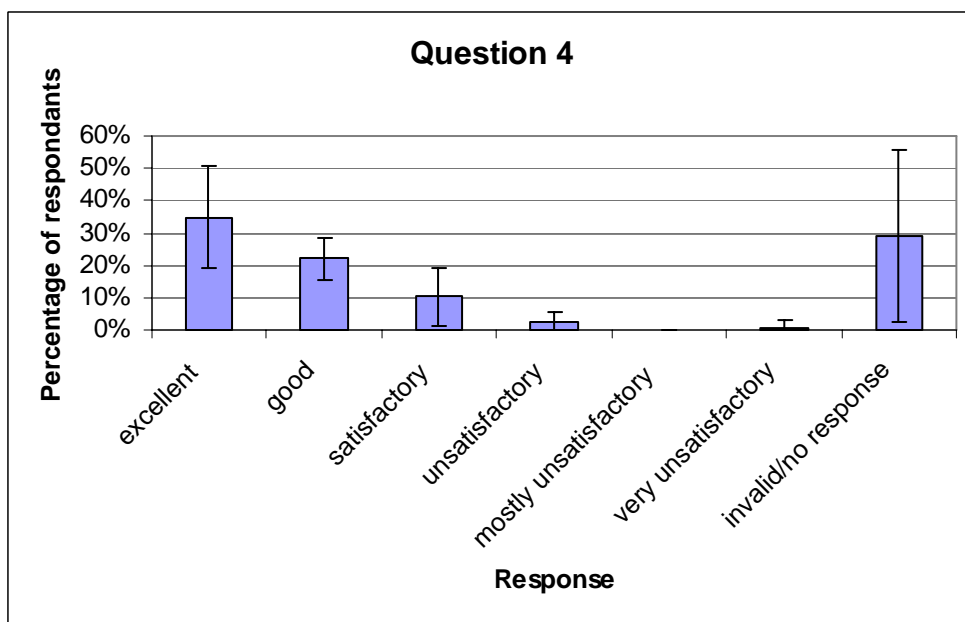


Figure 4: The materials and equipment available

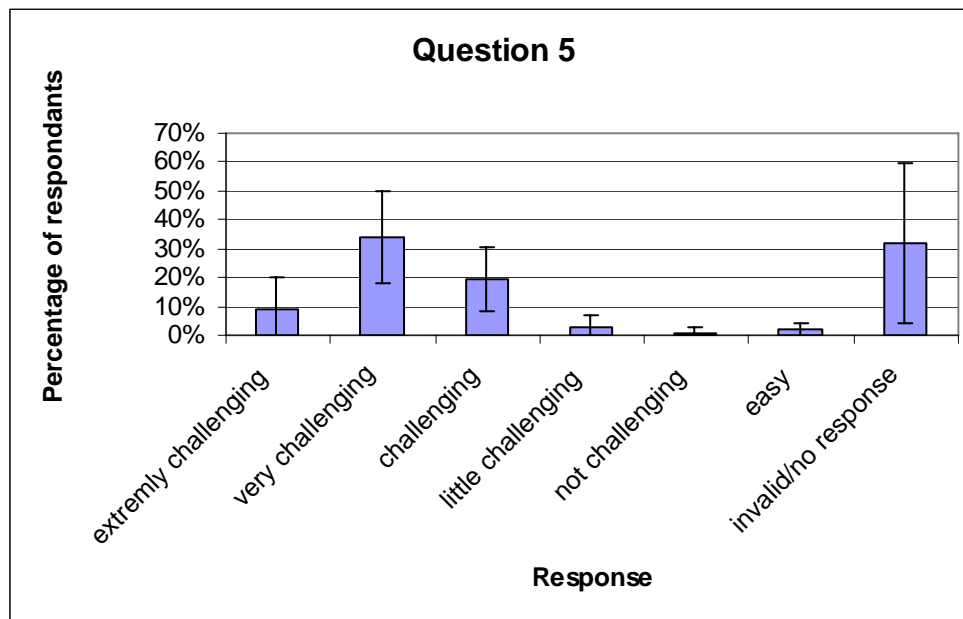


Figure 5: How much of a challenge was this exercise for the student personally?

Discussion:

The overall return rate of questionnaires was high at 71.8%. However, one group's response rate was only 29%, which could reflect unclear notions about the value of clinical nursing laboratories, the purpose of evaluation or the nature of nursing itself. Three other possible causes might have contributed to this fact:

- The author of this paper instructed four groups during their laboratory session but not the group with the low response rate. The high response rates in the four other groups could have been achieved because the students wanted to please the author.
- It is possible that students who felt indifferent or where dissatisfied chose to withhold their opinion. Why this should be the case in one particular group is unclear as the set-ups were identical and the active tutor involvement was limited to introduction and feedback.
- The group with the low response rate was the only group asked to fill in the evaluation form on a Friday afternoon – It is likely that some individuals had other arrangements and did not want to spare the time to answer the questions.

The majority of students acknowledged that the content of this exercise was very relevant to their course and careers (49%). When asked to grade the importance of problem solving abilities to a registered nurse, 50 % graded it as a very relevant and 20% as either mostly relevant or relevant. The team problem solving approach was graded as good by 32% of the respondents and 24% found it excellent. The set-up and the provided equipment received a positive reception with 35% of the respondents grading it as excellent and 22% as good.

When ask to grade the level of difficulty, 34% of students perceived the exercise to have been very challenging and 9% as extremely challenging. This leads to the conclusion, that even though students had been acquainted with most procedures

they needed to perform, their level of confidence to put those skills into a wider perspective was limited. Future education should focus on these weaknesses not only to familiarise learners with isolated psychomotor skills, but also to achieve higher levels of proficiency in dealing with complex tasks and situations.

Important aspects that emerged from the written comments taken from the evaluation form were:

- Many students felt initially overwhelmed by the task but appreciated the opportunity to take charge of their learning experience. **Student: "Interactive way of learning. I felt I learnt more because I experienced the situation rather than just read[ing] it or being taught about it."**
- It appeared important to the majority to be confronted with a problem that might occur in a clinical area where there was nobody else who had the solution at their fingertips. **Student: "Because it is all content we will be faced with when we are out on the ward"**
- The majority appreciated the fact that they were allowed to make mistakes and solve a problem without input of a superior, which gave them a sense of achievement. **Student: "Walked out on a high!! Was challenged and enjoyed having to learn something for myself and not being told about it and instructed to remember."**
- The participants realised the importance of good teamwork. **Student: "Working as a team was good as other members alerted me to things I was unaware of. I will now be more aware of this in a clinical setting."**
- Yet there were difficulties: **Student: "Because it was challenging – there was tension amongst our team but that was a learning experience, too."**
- The students also commented that this approach gave them a chance to reflect on their weaknesses and triggered a willingness to revisit topics. **Student: "Do more practical problem solving and read more info".**
- The simulation became remarkably "real" to some participants. **Student: "I felt frustrated and worried about the patient. I think he died as a result of huge delays in receiving his medication."**
- Others thrived upon the same: **Student: "I loved it for the reality aspect – it made me think for myself rather than checking with a facilitator every step of the way. I was able to draw on my theory and know why I need to check my procedure."**
- The simulation alerted the students to the stress they may be exposed to in the clinical environment, a fact that is sometimes neglected in the education system, and students are not being prepared for the "real life". This approach enabled the students to experience their limitations. **Student: "I found this lab quite stressful, and for the first time since enrolling in this course, I doubted whether this occupation really was for me."**

The tutors unanimously agreed that this laboratory was a worthwhile exercise. It engaged the students in teamwork, made them focus on the task and let them explore and discover. Even though this particular approach might not have suited every type of learner - **Student: "Waste of time for some, not for others"** - there is a need to offer a variety of teaching approaches to involve a maximum number of students in a satisfactory learning experience.

Conclusion:

This laboratory has given students and tutors alike a valuable opportunity to explore ways to enhance laboratory teaching and to equip nursing students with skills to master challenging situations in clinical environments. Students' inability to perform certain tasks accentuated teaching needs that will be addressed in future academic sessions. The feedback has allowed the department to pinpoint activities students are prepared to engage in to achieve their learning goals. Students' suggestions regarding the lab set up have been evaluated and will be used to improve provided equipment and props for future laboratories.

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