



Student evaluation of a Clinical Self-Study Laboratory

Keetsemang Saakane ^a, Mugarurwa John ^a, Shahidi Timothe'e ^a,
Maputhege Maphosa ^a, Chipps Jennifer ^a, Brysiewicz Petra ^{b,*}

^a Evaluation of Health Care Program Module, School of Nursing, Faculty of Health Sciences, University of KwaZulu-Natal, Durban 4041, South Africa

^b Clinical Self-Study Laboratory, School of Nursing, Faculty of Health Sciences, University of KwaZulu-Natal, Durban 4041, South Africa

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KEYWORDS

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Summary

Introduction: Being clinically competent is an essential component of any nursing curricula to ensure that on completion the nursing graduates are able to practice safely and effectively as a nurse. Clinical Self-Study Laboratories have become increasingly popular in nursing education in recent years as a way of ensuring a variety of skills are taught to the nursing students. These clinical skills laboratories are used to teach communication and interpersonal skills, psychomotor skills, promote the development of collaborative skills required in nursing as well as being able to help integrate theory and practice [Morgan, R., 2006. Using clinical skills laboratories to promote theory–practice integration during first practice placement: an Irish perspective. *Journal of Clinical Nursing* 15, 155–161]. However, it is essential that these programs be subject to routine quality assurance and effectiveness evaluation.

Methodology: The purpose of the study was to conduct a process evaluation of the implementation of the Clinical Self-Study Laboratory (CSSL) in the School of Nursing, University of KwaZulu-Natal. The process evaluation included a descriptive quantitative satisfaction survey of first and third year Bachelor of Nursing students, a checklist to assess the quality of the CSSL equipment and a retrospective record review of utilisation of the CSSL by students.

Results: The CSSL appears to be well implemented and utilized by students. Students reported that it was accessible and that the equipment in the laboratory was of a reasonable quality. A few students reported dissatisfaction with some of the equipment and requested that more equipment and trained personnel be made available.

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* Corresponding author. Tel.: +27 31 2601281; fax: +27 31 2601543.
E-mail address: brysiewicz@ukzn.ac.za

Introduction

Being a clinically competent nurse is an essential component of any nursing curricula to ensure that on completion the nursing graduates are able to practice safely and effectively as a nurse. As educational institutions around the world are changing to student self-directed learning, with the student accepting more responsibility for their own learning, it is important for clinical learning to follow the same trend (Ncama and Cassimjee, 2005).

The Clinical Self-Study Laboratory (CSSL) at the University of KwaZulu-Natal (UKZN) was established in 1994 as part of the restructuring of the Bachelor of Nursing (BN) program which leads to registration with the South African Nursing Council as a registered nurse (General, Community Health, Psychiatric nurse) and Midwife. The BN students in their first and third year of their degree are required to spend a great deal of time in the CSSL, gaining the necessary clinical skills. The students are required to plan their individual time during the semester in the CSSL and use the various competency baskets to learn and practice the list of clinical skills they have been given in their class guide. When the individual student feels competent with a particular clinical skill they ask the nursing tutor working in the lab to evaluate them using a standardized checklist. The students are required to provide proof of passing the checklist for the individual clinical skill in the CSSL before being able to perform this clinical procedure on a real patient.

Clinical skills laboratories have become increasingly popular in nursing education in recent years as a way of ensuring a variety of skills are taught to the nursing students. According to Du Boulay and Medway (1999), most existing clinical laboratories have developed in response to changing health care policy, curricular initiatives and increasing emphasis on the quality of assessments and competencies. These laboratories are seen as being useful to teach communication and interpersonal skills, psychomotor skills, promote the development of collaborative skills required in nursing as well as being able to help integrate theory and practice (Morgan, 2006). Hao et al. (2002), are of the opinion that students can learn selected clinical skills in a simulated situation as effectively as a true patient encounter, without taxing patient care. Moorthy et al. (2005) agree that simulation based learning is interactive and occurs within realistic environments. This allows the learner to appreciate the consequences of their actions without causing any harm to the patient. It also allows the learner to practice crisis or emergency events so

that they are prepared to deal with them should they occur in real life. According to Alvernia College (2006), nursing skills laboratories provide a supportive and caring environment for students to practice and demonstrate nursing skills, before moving into the practice setting with patients. It provides an opportunity to become familiar with equipment and technique in a non-threatening environment. Practicing psychomotor skills in such an environment decreases anxiety for the students, increases confidence and may even be viewed by the learners as fun (Morgan, 2006). A study by Freeth and Fry (2005) demonstrated that both students and tutors enjoyed learning and teaching within the clinical laboratory, and valued the laboratory as a teaching environment which supported the linking of theory and practice. This increased confidence allows the students to broaden the scope of their learning thus enriching their clinical experience. The skills laboratories allow the students the opportunity to observe, practice and learn using a variety of teaching and learning aids (Childs, 2002).

Bradley and Bligh (2005) however caution that the educational benefits of clinical laboratories is still unproven with little evidence to prove the efficacy and transferability of skills, the impact on patient care as well as the cost of health care. This is supported by Moorthy et al. (2005) who suggest that better evidence of efficacy and cost effectiveness of simulation is necessary. Freeth and Fry (2005) also question the relationship between performance in the laboratory and performance in the clinical area. Bradley and Bligh (2005) go further to suggest that clinical skills laboratories may even cause a fragmented approach to teaching and learning due to the fact that they are often placed away from the clinical environment. A systematic review carried out by Issenberg et al. (2005) supported the fact that research in this field needs improvement in terms of rigour and quality, however they found that simulations are educationally effective and complement medical education in the patient care settings.

Clinical laboratories have become increasingly popular, but despite the potential benefits for the students, it must be remembered that the skills laboratories can only provide simulated experiences and cannot replace the real clinical experience (Du Boulay and Medway, 1999). It is therefore of critical importance that skills laboratories are evaluated in terms of the nursing curricula as well as the identified needs of the students (Childs, 2002). However, very few evaluation studies of CSSL's were found in the literature.

Evaluation is a process of systematic investigation of the merit, worth or significance of a program (Scriven, 1998). To evaluate the CSSL, it was essential to initially conduct a process evaluation to determine whether the CSSL was implemented the way it was intended. Process evaluation should focus on how the program is implemented, how it operates, if it reaches and satisfies the target population, and whether the materials used are relevant, adequate, and appropriate (Hawe et al., 1990). Once this has been established, evaluation research can be conducted to determine the impact (short term objectives) and outcome (long term objectives) of the CSSL in terms of assessing student's clinical skills.

The process evaluation of the CSSL was conducted as part of the Evaluation of Health Care Programs Module, which is a compulsory requirement of the post basic Bachelor of Nursing Advanced Practice at the UKZN. Since the CSSL had not been formally evaluated since its inception, four students were allocated to evaluate the CSSL. These four students were all registered nurses from across Africa who had come to South Africa to further their education. Two of them were specialising in nursing education (KS and MM in their second year of studies) whereas the other two (JM and TS in their first year of studies) were specialising in nursing management. This evaluation used the Centre for Disease Control (CDC) evaluation framework. The framework is a six stage evaluation process of engaging with stakeholders, describing the program, focusing the evaluation design on process (activities of the program), impact (objectives of program) or outcome (goal of program) evaluation, collecting data, justifying results, and ensuring that lessons learnt are used by providing feedback to stakeholders. Central to the framework are four standards central to any evaluation, namely accuracy, utility, propriety and feasibility (CDC, 1999).

Aim of the study

The aim of the study was to evaluate the CSSL at UKZN by carrying out a process evaluation study to evaluate the satisfaction, access, quality and efficiency of the CSSL.

Purpose of study

Evaluators hoped that this would serve as a baseline for further evaluation of the effectiveness of the CSSL to train clinically competent nurses.

Research objectives

- To evaluate the first and third year B Nursing students' satisfaction with learning clinical skills in the CSSL.
- To evaluate the first and third year B Nursing students' access to the CSSL facilities.
- To evaluate the quality, appropriateness and availability of the equipment used to gain clinical skills in the CSSL.

Definition of terms

Clinical Self-Study Laboratory (CSSL)

A CSSL is a student oriented learning environment that provides resources for the learning of the clinical skills applicable to nursing practice (Ncama and Cassimjee, 2005).

Competency basket

A basket in the CSSL which contains all the necessary equipment namely the literature, surgical supplies etc. that the student needs to practice and master a particular clinical skill.

Students

First and third year Bachelor of Nursing students registered at the UKZN.

“Efficiency utilisation”

A ratio of “hours booked/ available hours” depicting how efficient the utilisation of the CSSL is.

Ethical considerations

Ethical clearance to undertake this study was sought and obtained from the UKZN Ethical Committee as all research through the university requires ethical permission. Permission to conduct this evaluation was obtained from the Head of School, the BN program coordinator, as well as the coordinator of the CSSL. Permission to administer questionnaires to students was sought from lecturers as this was done during lecture time. The purpose of the evaluation was explained to the students and they were told that they could withdraw from the study at any time. Verbal consent was obtained from the students and the handing back of a completed questionnaire was taken as consenting

to participate in the study. Confidentiality was maintained during the entire process of program evaluation and data could not be traced back to individuals.

Research design

A simple quantitative design was used with three separate evaluation tools to evaluate student satisfaction, quality of equipment and access and utilization of the CSSL.

Population and sample

The population included all first year (41) and third year (32) students registered in the BN Program in the School of Nursing, UKZN for 2006, a total of 73 students. These students were selected as they were completing their general nursing clinical skills and are the students who use the CSSL the most. As the study population was small and some student might have refused to participate, no sample was taken and all students were included in the study.

Data collection tools

The three evaluation tools developed comprised a de-identified anonymous self-administered student survey (for first and third year students), a checklist to evaluate the CSSL equipment and a Booking Register record review checklist to assess the student utilisation of the CSSL. The self-administered questionnaire included the following sections: demographics, access to the CSSL, overall satisfaction with the CSSL, and satisfaction with specific clinical skills equipment. Many problems with questionnaire analysis can be traced back to the design phase of the tool and the evaluators attempted to ensure that the questionnaire was developed to directly address the objectives of the study (StatPac, 2007).

Validity and reliability

To test the face and content validity of the questionnaire, the initial draft of the instrument was presented to two subject experts: the coordinator of the CSSL (clinical skills expert) and the lecturer of the Evaluation of Health Care Program Module (evaluation expert). These experts evaluated the content in association with the objectives and the conceptual framework. The subject experts recom-

mended the rephrasing of a few questions which was done. To test the reliability, whether respondents understood the instrument and completed it comprehensively, a pilot study was conducted. The pilot study was carried out on a small sample of post basic students who had previously used the CSSL. Minor errors were corrected in the questionnaires and data from the pilot study were not included in the final data set.

Data collection procedure

To administer the survey time was allocated during class for students to complete the questionnaires. Questionnaires were collected by the evaluators (the four students), coded and data entered into Epi Info(TM) version 3.2.2 2004. Epi Info(TM) is a free statistical software package developed for public health researchers by the Centre for Disease Control (CDC) Atlanta, United States of America. To evaluate the equipment in the CSSL, the evaluators used a checklist to conveniently select 12 out of a possible 29 competency baskets and two evaluators completed the checklist for each basket selected. To assess the utilisation of the CSSL, the evaluators conducted a record review of the CSSL usage for the month of March 2006.

Findings

Demographics

Sixty (82%) students completed the questionnaires. Of these 33 (55%) were first years and 27 (45%) were third years (response rates of 80% and 84%, respectively). The average age of respondents was 21 years with the youngest being 19 years and the oldest 31 years old. Of these, 49 were females (82%) and 11 males (18%).

General use of the CSSL

Due to the different competency requirements in first and third year, the general use of the CSSL were analysed separately for first and third years. Most first years (64%, $n = 21$) reported using the CSSL once a week compared to twice a week by third years (63%, $n = 17$). Both groups reported that when they do book the CSSL, they booked an average of 2 hours per day.

In analysing the number of bookings per month, a total number of 542 student bookings (an average of 108 students per week or 22 students per day)

were recorded in the month of March 2006. Most students booked to use the CSSL in the middle of the month with the number of student bookings being the lowest in the beginning and the end of the month. Mornings were also more popular than afternoons. When calculating the average number of hours spent in the CSSL per student per week, it was calculated at 1.9 h per student which was consistent with their self reported data.

The total number of available hours for booking the CSSL per week is calculated at 202.5 h or 40.5 h a day. The average number of hours booked per week was 202.3 showing an average 100% utilization efficiency over the month of March, ranging from 115% (week 1) to 80% (week 5). The CSSL was overbooked in the first week of the month of March 2006 and underutilized in the last week.

Access and availability of CSSL

Most students (82%, $n = 49$) indicated that the CSSL was available when they needed it. Only 11 (18%) students reported that the CSSL was not always available and one student did not comment. Most students (75%, $n = 45$) were satisfied with the number of hours allocated to the CSSL with 15 (25%) students reporting not being satisfied.

Satisfaction with support in CSSL

Most of the supervision of clinical procedures was conducted by the CSSL Manager (73%, $n = 44$), followed by Nursing Education Students (30%, $n = 18$) and Nursing Lecturers (13%, $n = 8$). Almost all of the students (93%, $n = 56$) reported that they were satisfied with the level of guidance they received in the CSSL. Of these, 63% ($n = 35$) of the students were only satisfied, but 38% ($n = 21$) were very satisfied. Eight students (13%) also commented that more supervisors were needed. Other comments for improving the support in the CSSL included a controlled booking system (2 students (3%)), more equipment (1 student (2%)) and better quality supervision (1 student (2%)).

Quality of equipment in CSSL

Quality of equipment was rated by the evaluators and by students' ratings.

Evaluator rating

The evaluators checked the availability and quality of the equipment in 12 out of a total of 29 competency baskets. Equipment was rated as in good

condition if it was not broken and if it could still be used for the required competencies. Availability was judged according to the basket checklist. Out of a total of 112 items to be checked in the 12 baskets, 19 (17%) items were missing and one item (1%) was broken. There were missing items in all but two baskets and one basket had half of the items missing. A limitation was that the evaluators did not have a standard checklist of what equipment a skills laboratory ought to have.

Student rating

Students rated their satisfaction with overall quality, relevance, availability and adequacy of the equipment (Table 1), and the specific individual baskets (Table 2 and 3).

Most students (72%, $n = 43$) reported satisfaction with the equipment in the CSSL with only 17 students (28%) disagreeing. Most students reported that the equipment was relevant to their competencies and generally available but 80% ($n = 48$) felt that there was not enough equipment for every student to practice competencies at any desired time (Table 1). A limitation of the study was that the ratings were based on the students' perception of satisfaction and there were no standard indicators of adequacy available for them to rate equipment against.

The specific equipment for each competency was also rated. The thirty-three first year students rated the five baskets containing the seven first year competencies of bed making, bed bath, mouth care, lifting patients and range of movement exercises (70–91% response rate per basket). On average, more than half of the students rated the competency baskets as satisfactory; except for the mouth care competency basket with only 11 out of 23 students (48%) rating it satisfactory.

Table 1 Student satisfaction with equipment in the CSSL

Criteria	Satisfied (%)	Comments
Relevance	82	Most of the students thought the equipment were relevant to their competencies
Availability	39	Always available
	60	Sometimes available
Quantity	22	Not enough equipment
Quality	45 good	Some models in poor condition
	37 ok	Some equipment old, e.g. gloves
	17 poor	

Table 2 Number and per cent of first year students ($n = 33$) satisfied with first year competencies resources available

First year competency	Satisfied	Unsatisfied	Missing data	Per cent satisfied ^a (%)
Bed making				
Unoccupied bed making	17	13	3	57
Occupied bed making	20	10	3	67
Bed bath	24	6	3	80
Mouth care	11	12	10	48
Lifting patients				
Lifting and moving the patient	19	10	4	66
Science of moving safely	19	10	4	66
Checklist for range of motion exercises	21	5	7	81

^a Per cent calculated using total respondents as denominator. The assumption is made that students who did not respond, have not yet completed the competency.

The mouth care competency also had the lowest response rate (70%) with 10 (29%) students not rating it (Table 2). The twenty seven third year students rated the 24 baskets that contained the 58 third year competencies (67–100% response rate). On average most of the students rated the competency baskets as satisfactory, except for blood glucose monitoring (Table 3).

Discussion of the findings

The study aimed to conduct a process evaluation of the CSSL at the School of Nursing, UKZN, in terms of utilization, access and availability, quality of equipment and student satisfaction with the CSSL. Using the CDC evaluation framework (CDC, 1999), evaluation of education programs such as the CSSL, can help demonstrate accountability to funding sources and stakeholders, examine cost effective use of resources and improve program operations (Loe et al., 2005). In addition, an important benefit of carrying out the evaluation process is the opportunity for program personnel to be involved in the process and to learn about their own programs (Loe et al., 2005). By integrating the principles of this framework into the evaluation of the CSSL at the School of Nursing, it stimulated innovation towards improvement of the CSSL and ensured that the CSSL coordinator and manager were better positioned to detect program effects and to translate findings into practice.

Overall the CSSL appears to be well implemented and well utilized by students. Sixty (82%) students completed the questionnaires and these included 33 (55%) first years and 27 (45%) third year students. These students reported that the CSSL was available when they wanted to use it and that in general,

the equipment was of reasonable quality. However, three specific concerns were identified.

Firstly, some students reported dissatisfaction with some of the equipment being old and broken. Ncama and Cassimjee (2005), cautioned that the CSSL is a challenge to maintain in order to ensure that the numerous and diverse learning opportunities are made available for the students.

Secondly, the appropriateness of some clinical skills for CSSL use was questioned with low satisfactory ratings for blood glucose monitoring (43%). Learning the clinical skill of blood glucose monitoring in the CSSL is problematic due to the fact that there are no models available to simulate this and one is required to actually prick a person's finger to obtain real blood. In the CSSL there are insufficient surgical supplies to allow for each student to practice and be evaluated in this clinical skill as well as the added risk of the transmission of blood borne diseases. Due to the health and safety concerns for students regarding the learning of this clinical skill, students are currently asked to use the available resources in the CSSL to learn the theory only and then practice and be evaluated by their clinical facilitator in the clinical setting.

A third concern appears to be that there is not enough equipment for every student to practice the same clinical skill at a given time and this combined with the shortage of supervisors or trained mentors in the lab during "high traffic" times may affect the clinical competency development of students. The clinical skill of mouth care is in high demand by the first year students, and this may be linked to the poor satisfactory rating of 48%. Childs (2002) identified the lack of appropriate equipment as a barrier to the utilization of the CSSL, although also noted that tight budgets often added to this challenge.

Table 3 Number and per cent of third year students ($n = 27$) satisfied with third year competencies resources available

Third year competency	Satisfied	Unsatisfied	Missing data	Per cent satisfied ^a (%)
Eye swabbing and instillation of medications into the eye	14	6	7	70
Injections				
Pre-test drug dosages	22	4	1	85
Preparations of injections	24	3	0	89
Administering intramuscular injection	21	6	0	78
Administering subcutaneous injections	21	6	0	78
Administering intradermal injections	19	8	0	70
<i>Dextrostix monitoring</i>	10	13	4	43
Information only	20	3	4	87
Suctioning				
Suctioning a tracheotomy	13	5	9	72
Pharyngeal and endotracheal suctioning	15	3	9	83
Administration of a fleet enema	15	8	4	65
Collection of a blood specimen	12	9	6	57
Administration of a nebulization	22	5	0	81
Collection of urine				
Catheter specimen of urine	26	1	0	96
Collecting a mid stream specimen of urine	24	2	1	92
Emptying a urine drainage bag	25	1	1	96
Urine testing	21	4	2	84
Offering and removal of a bedpan	26	1	0	96
Pre and post operation checklist	23	3	1	88
Medication				
Pre-test for drug dosages	24	3	0	89
Administration of oral medications	24	3	0	89
Topical treatment	25	2	0	93
Insertion of a vaginal cream/pessary	25	2	0	93
Administration of medications by metered dose inhaler	25	2	0	93
Insertion of a rectal suppository	22	4	1	85
Testicular examination	11	7	9	61
Breast examination	13	5	9	72
Asepsis				
Medical asepsis	25	2	0	93
Surgical asepsis	25	2	0	93
Opening a sterile pack	22	4	1	85
Pouring in of sterile solution	21	5	1	81
Gloving up	25	2	0	93
Blood transfusions and reactions	15	10	2	60
Checklist for oxygen therapy	22	4	1	85
Bandaging				
Applying a bandage to an arm or leg	23	2	2	92
Bandaging a below knee stump amputation	23	1	3	96
Changing an ostomy appliance	15	4	8	79
Wound care				
Dry sterile dressing	19	6	2	76
Irrigation of an open wound	19	5	3	79
Drainage site dressing	19	5	3	79
Wet to dry dressing	21	3	3	88
Obtain a wound swab	23	2	2	92
Emptying a portovac drain	21	4	2	84
Clean and dress a burns site	23	3	1	88

(continued on next page)

Table 3 (continued)

Third year competency	Satisfied	Unsatisfied	Missing data	Per cent satisfied ^a (%)
Intravenous therapy				
Calculation of the drip rate	24	3	0	89
Initiation of IVT	22	4	1	85
Changing IVT	23	3	1	88
Discontinuing IVT	23	3	1	88
Closed drainage				
Changing the closed drainage system	11	6	10	65
Removal of the closed drainage system	12	5	10	71
Nasogastric tube				
Insertion of a NGT	24	1	2	96
Administering of an NGT feed	22	3	2	88
Removal of the NGT	24	1	2	96
Suturing				
Removal of sutures	13	7	7	65
Removal of clips	14	5	8	74
Catherisation				
Insertion of a urinary catheter	14	6	7	70
Removal of a urinary catheter	21	3	3	88
Removal of a urinary catheter	21	3	3	88

^a Per cent calculated using total respondents as denominator. The assumption is made that students who did not respond, have not yet completed the competency.

Limitations

There are a number of limitations to this study:

- The bookings in the CSSL were observed for a period of a month and it was not possible to differentiate between first and third year students bookings in the Booking Register. This may not give a true reflection of the utilization of the CSSL.
- Equipment was rated as in good condition if it was not broken and if it could still be used for the required clinical skill. Availability of the appropriate equipment was also judged according to the checklist available in the CSSL. The evaluators did not have a standard checklist of what equipment a skills laboratory ought to have.
- Only approximately half of the students from first and third year completed the evaluation questionnaire.
- In the evaluation questionnaire, there were no indicators of adequacy available to respondents to rate it (adequacy) against. This meant they could check that the competency basket was complete but there were no objective criteria against which they could check whether what was essential to be included in the basket.

Recommendations

Following this program evaluation the evaluators have a number of recommendations:

- Where possible, there should be more than one basket per competency to provide enough materials to meet the needs of the users of the CSSL. It would particularly be useful to provide more than one basket for a few of the competency baskets, which are in high demand by the students.
- More supervisors or mentors should be present when competencies are practiced or during "high traffic" time in the laboratory. Due to limited human resources this recommendation is presently not possible.
- The maintenance and daily checking of equipment against the clinical skills check list needs to be done as one of the biggest complaints from the students was missing equipment. Due to limited human resources this recommendation is presently being attempted but as there is only one staff member in the CSSL this is not always possible.
- A computerized booking system would be used to enable easy tracking of utilization and access of the CSSL.

- Students should be required to record their full names when booking to facilitate follow up and evaluation towards the utilization of the skills laboratory.
- An impact evaluation, measuring the number of competent assessments completed should be conducted.
- An outcome evaluation measuring the competence of student's clinical skills in practice should be conducted.

Conclusion

The CSSL at UKZN appears to be well implemented and utilized by students. Students reported that it was accessible and that the equipment in the laboratory was of reasonable quality. Few students reported dissatisfaction with some of the equipment being old and broken and requested more equipment and trained personnel be made available. These recommendations can be used to ensure that the CSSL is able to teach the required communication and interpersonal skills, psychomotor skills, promote the development of collaborative skills required in nursing as well as being able to help integrate theory and practice.

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