PERCEPTIONS OF STUDENTS AND NURSE EDUCATORS ABOUT TEACHING AND LEARNING IN THE CLINICAL SKILLS LABORATORY IN KIGALI HEALTH INSTITUTE/RWANDA: AN EXPLORATORY-DESCRIPTIVE STUDY

A Dissertation Submitted

To

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DECLARATION

I, UWIMANA Catherine, declare that this dissertation titled "Perceptions of students and nurse educators about teaching and learning in the clinical skills laboratory in Kigali Health Institute/Rwanda: An exploratory-descriptive study" is my original work. It has never been submitted for other purpose, or at any other University. Sources of information utilized in this work have been acknowledged in the reference list.

Signature: _____

Date: 23/3/09

31/03/2009.

DEDICATION

This dissertation is dedicated to my brother Safari Egide, and my

children Steven, Clement and Clemency, my brother and sisters

and other friends especially Teddy for all their love, support and

encouragement

ACKNOWLEGMENTS

To Cecile and Thedy for taking care of my children in my absence.

My gratitude goes to the KHI research committee who granted me permission to conduct the study.

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ABSTRACT

In the past, clinical skills were wholly performed at bedside in which patients were used as teaching aids. The profound change in professional education and health care systems had made this teaching method less effective. Therefore clinical skills laboratory (CSL) is widely adopted as a strategy to support student development of clinical skills. However, there is little empirical evidence about perceptions of students and nurse educators engaged in day to day learning and teaching in the CSLs.

This study was therefore aimed at exploring the perceptions of students and nurse educators about teaching and learning in the clinical laboratory in Kigali Health Institute in Rwanda.

This study was a quantitative descriptive exploratory design. Data were collected trough the use of questionnaires. Students, nurse educators were asked to rate their views on a 5 points Likert scale about antecedents, teaching and learning strategies used in the CSL, teaching and learning process, benefits of the teaching and learning in the CSL and limitations. Three open ended questions were asked to nurse educators about the benefits of teaching and learning in the CSL, limitations and their recommendations for effective use of the CSL. A document review was done to complete data. The total number of participants who returned questionnaires in this study was 214 students and 17 nurse educators.

The results of this study revealed that students and nurse educators view the teaching and learning valuable, the location of the CSC was important factor in students teaching and learning, resources were available and the CSL administration ensured smooth running of the CSL. However there was a lack of enough staff for effective teaching and learning in the CSL. The findings revealed that innovative teaching and learning strategies (demonstration, peer learning, small group, reflective learning and self directed learning) were used in the CSL. The CSL was accessed through booking and time tabled sessions and students support from nurse educators was ensured. The CSL was seen by both students and nurse educators as a learning environment which supports the linking of theory and practice, ensure students practicing skills, offer to student a safe environment to learn. However there was a gap in teaching and learning communication skills. There was limitation for teaching and learning as it is costly in staffing resources and maintenance, not clearly stated in the curriculum and KHI academic policy, time consuming for nurse educators and requires expertise from nurse educators to cope with students needs.

The findings espouse many previous study findings in nursing education domain. The results reflected that the location or accessibility of the CSL, as well as the availability of material and human resources, having a CSL coordinators is critical to ensure effecting teaching and learning in the CSL, the teaching and learning process favour innovative teaching strategies, other researches in the area revealed benefits and limitation of the CSL.

Recommendations made were related to staff recruitment for the CSL, the need to review nursing curriculum and KHI academic policy to accommodate the use of the CSL, address effectively communication skills and further research for the depth exploration of this area.

LIST OF ABBREVIATION

CSC: Clinical Skills Center

CSL: Clinical Skill Laboratory

KHI: Kigali Health Institute

NGO: Non-governmental organization

OSCE : Objective Structured Clinical Evaluation

 ZPD: zone of proximal development

KEY WORDS

Clinical teaching

Psychomotor teaching

Clinical skill laboratory

Clinical skills Center

Simulation

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1.1. Introduction and Background to the study

Curricula revolution and challenges in the clinical settings have popularized the use of alternative clinical settings, such as the clinical skills laboratories (Stark and Fortune, 2003). According to Du Boulay and Medway (1999), the paradigm shift to the use of clinical skills laboratories (CSL) resulted from the emphasis on competency-based education, overpopulated clinical settings leading to high competition over learning experiences and the need for an environment that will simulate reality so that reality can be better understood, controlled and practiced. Dent (2001) stated that teaching in simulated environments such as the CSL, using simulation resources allows educators to control the structure, timing and complexity of the learning environment so that trainees can participate in an educational experience which is educationally sound, reproducible, standardized, structured and objective (Dent, 2001).

Childs (2002) stated that having a place where students can observe and practice clinical skills before entering the actual clinical setting is critical. This author strongly supports the exposure of students to the CSL first before placement in real life settings to develop required competencies. According to Freeth and Fry (2005), CSL can ease pressure on clinical skills development and assessment in clinical areas and provide added value to students by learning through experiential in a self-directed learning environment. Nyuswa (1999)

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described a CSL as an early focus point where nurse educators may promote theory-based practice, facilitating the linking of theory to practise in a less stressful environment. Du Boulay and Medway (1999) postulated that new and advanced skills may be practised in a simulation setting to allow the student the opportunity to focus on learning without the environmental destruction of a clinical setting. Godson, Wilson and Goodman's (2007) study revealed that the students considered learning in the CSL as a good way to learn because the safe environment of the CSL builds up their confidence. Mentors from the clinical settings who also participated in this study described the CSL as a useful learning environment because students come better prepared to their placement, thereby reducing their workload.

Scott (2001) stated that there is an inherent assumption in the literature that clinical laboratories are necessary, but there is limited discussion of what constitutes the required infrastructure for undergraduate clinical laboratories and how should learning be facilitated in the CSL. Childs (2002) conducted an integrative literature review about CSL and nothing could be found in the literature that describes the physical structure, resources, budget, or administration of these centres. This researcher recommended further research in this area. Barriers revealed by Child's study included limited space, lack of staff, and appropriate equipment and technology, as well as a mismatch of curriculum and resources.

Bradley and Bligh (2005) noted that the educational benefits of clinical laboratories are still unproven. Furthermore, there is little evidence to prove the efficacy and transferability of skills learned in the CSL and the impact on patient care. Bradley and Bligh (2005) raised concerns about a CSL that it is aimed at replacing some of the learning experiences which are better learned in the clinical settings. For example, hiring and training patients to simulate patients in the real hospital settings because of high competition over learning experiences in the clinical settings. According to these authors, such clinical settings may cause a fragment approach to teaching and learning with limited exposure of students to dynamic and real life experiences in the clinical settings undertaken in isolation from the rest of the client care in real settings and claims that it negates the concept of holism which is usually prominent in nursing curricula.

The authors assert that CSL cannot replace real life settings. Despite the potential strengths of teaching clinical skills in the CSL, teaching in this setting has been much criticized for its variability lack of intellectual challenge, and haphazard nature (Dent, 2001). In other words, clinical teaching in the CSL is an educationally sound approach, all too frequently undermined by problems of implementation. Freeth and Fry (2005) pointed out that published accounts of innovation in CSL tell part of the story but little is known about perceptions of students and tutors engaged in day-to-day learning and teaching in CSLs.

1.2. Study Context

Kigali Health Institute has three campuses; the main campus, Kigali, allocated in Kigali City, the NDERA campus which accommodates Mental Health Department and Kibuye (Nyamishaba) campus which is far away from Kigali City. All first year nursing students are placed in the Kibuye Campus. Nursing is one of the three faculties in KHI (other faculties are the Faculty of Allied Health Sciences and the Faculty of Community health development). The faculty of Nursing Sciences has three departments: Department of General Nursing, Department of Midwifery and the Department of Mental Health (http://www.khi.ac.rw/about_khi.html). This study only focus on the nursing and midwifery department, mental health department situated in Ndera Campus will not be part of this study. Kibuye campus students will not be part of this study because first year students have their own clinical skills laboratory which caters for all department and they use Kigali campus when they shift from Kibuye campus to Kigali main campus in second year. The nursing and midwifery departments have day and evening programmes. It offers nursing at a diploma level and at a degree level. The duration of a diploma day programme is three years and those doing it in the evening take four years. The bachelor's degree programme which was introduced in 2006 takes four years and is offered during the day only. The nursing staff in the nursing and midwifery department comprises of permanent and part time lecturers, as well as clinical educators who supervise students in the CSL and in the clinical setting. The total permanent lecturers and clinical educators are 17 (10 nurse educators and 7 clinical

educators). The CSL was established five years ago with the support of a Belgium organization as a project to assist KHI achieves its mission to train qualified health givers for Rwandese health needs. It is fully integrated in the department of nursing and midwifery and it has two well equipped practical rooms, one computer lab, one room for staff offices and one store. The laboratory is accessible to the day as well as evening students.

1.3. Problem Statement

According to Boxer and Kluge (2000), few recent studies have been conducted to identify essential skills for graduate nurses that could ensure adequate preparation of new graduates to cope with the clinical practice. Wellard, Woolf and Gleeson (2007) explored the use of CSL in schools of nursing in Australia. The findings in their study revealed that there was little empirical evidence about the role CSL plays in students' learning or how they assist linking theory to practise. The findings also expose that teaching approaches used in the CSL were traditional rather than innovative, with teacher talk dominant rather than promotion of self-directed learning. Furthermore, the findings revealed that the CSL evolved in response to environmental challenges they were not well thought through and they were implemented without preparation of facilitators for their roles. Wellard, et al's (2007) study further revealed that it remains unclear if laboratory learning experiences assist students in the translation of theoretical knowledge to practice.

In Rwanda, five years ago, Kigali Health Institute, School of Nursing set up a CSL to be used by A1 nursing and midwifery students. In 2006, the school introduced a Bachelor's degree in the nursing. Students from this programme also make use of the CSL. In view of the above, one can state that the CSL in KHI caters for a variety of students, who have different learning needs. In addition, KHI CSL records showed low utilisation of this facilities by evening program students. Ever since this laboratory was established no research has been conducted regarding its utilization or the teaching and learning in this CSL, which is supposed to be self-directed. Before the adoption of this self-directed CSL, KHI was using a demonstration room, which was teacher directed. The researcher therefore intends to explore perceptions of students and nurse educators about teaching and learning in the CSL in KHI.

1.4. Purpose of the Study

This study is aimed at exploring the perceptions of students and nurse educators about teaching and learning in the clinical laboratory in Kigali Health Institute.

1.5 Research Objectives

1. To identify antecedents of effective teaching and learning in the CSL

2. To explore the nature of the teaching and learning process in the KHI CSL as perceived by students and educators.

3. To describe the benefits of teaching and learning clinical skills in the CSL KHI as perceived by students and educators

4. To describe the limitations of teaching and learning clinical skills in the KHI CSL as perceived by students and educators.

1.6 Research questions

1. What is in place in the KHI CSL to facilitate teaching and learning of clinical skills?

2. Which teaching approaches are used during the teaching and learning process in the CSL?

3. How is learning facilitated in the CSL (the teaching-learning process)?

4. What are the benefits of teaching and learning clinical skills in the CSL in KHI?

5. What are the limitations of learning clinical skills in the CSL in KHI?

1.7 Significance of the Study

A study of this nature is the first to be conducted at Kigali health Institute in Rwanda. Having the mission to train competent nurses in quality and quantity to serve Rwandese population at all levels of health care became a challenge for KHI. Having begun the case-based curriculum in the nursing department and having established a clinical skills laboratory in the department, the KHI nursing faculty faced a challenge to make it a success. The finding of this study would help KHI administration, students, CSL staff see the CSC appropriateness and in teaching and learning nursing skills and its limitations therefore be informed by the needs of students and staff using it. This could be the database on which any researcher can build on while making further investigations in the same area.

emphasize the empathy that is required to see and feel the point of view of the person being studied. My task is difficult as objectivity is the key to successful researching, but I do believe that it is my similar circumstances to the respondents that will enable them to feel comfortable in answering the questions as honestly as possible.

Antecedents in this framework include the laboratory environment itself, the accessibility of the CSL, resources (human and material resources) and management of the CSL. According to Du Boulay and Medway (1999) a CSL is a dedicated space for teaching clinical skills. The physical environment of the CSL according to Bradley and Posthethwaite (2003) should be flexible to allow a range of simulated clinical settings (for example, wards, and consulting rooms, emergency departments, operating theatres or therapy rooms). It should also provide spaces suitable for workshops, computers for computer-based learning resources, videotaping and small group learning. The CSL should be designed to support the intended learning outcomes (Du Boulay and Medway, 1999).

Accessibility refers to the location and hours of operation of the CSL. The laboratory should be located where it can be easily accessed by the students and the hours of operation should accommodate the needs of the students.

Learning resources in the CSL include clinical, diagnostic and therapeutic equipment, a range of models and manikins, audio-visual material and computers for computer-based learning material. The manikins may vary from simple part task trainers to highly sophisticated human patient simulators. Du Boulay and Medway (1999) warn that care must be taken when choosing equipment to ensure that it matches specified requirements for teaching and learning.

According to Stark and Fortune (2003) teaching staff in order to facilitate learning in the CSL may be configured in a number of ways and may be drawn from a variety of backgrounds. These authors state that appropriate staff development is required to ensure consistency and quality of teaching with monitoring and evaluation to assure appropriate standards. They further recommend that patients can also play a role, not only as passive teaching material, but also as teachers and assessors. Regarding *laboratory management,* the management of skills laboratory involves consideration of issues such as ensuring that the environment is in a required state, ensuring security, safety and supervision of the learning of the students. Furthermore, laboratory management includes insuring period evaluation of the functioning of the CSL and ensuring that the functioning and management of the CSL is informed by the needs of students, staff using it and experts in the area of CSL.

Zone of prodromal development: In this framework refers to what takes place during the teaching learning process, the teaching methods used. It is that space or distance between the actual developmental level as determined by individual problem solving level and the level of political development as determined through problem solving under adult guidance or in collaboration with more capable peer (Vygosky,1896-1934). According to Wellard, Woolf and Gleeson (2007), innovative ways of teaching in a self-directed learning CSL should be promoted, with the teacher playing a facilitatory role and the student taking an active role in identifying the learning needs, relevant resources,

engaging in the process of learning and ensuring that they approach the facilitator to be assessed whether they are competent or not. Teaching in the CSL has a number of *benefits and limitations* according to this framework.

In conclusion, the antecedents have an influence on the success of the teaching learning process. The teaching and learning of skills in the CSL has a number of benefits and limitation.

1.9 Operational definitions of concepts

Nursing department: Department which is responsible for general nurses' training in KHI

Midwifery department: Department in charge of midwives training in KHI

Clinical skills centre/Clinical skills Laboratory: These terms are used interchangeably in this research and refer to a dedicated space simulating a clinical environment. This space is for teaching clinical skills with a range of models, manikins, diagnostic and therapeutic equipment in simulated clinical environments (wards, consulting rooms, emergency departments, operating theatres or therapy rooms), as well as spaces for computers, space suitable for workshops, group teaching and videotaping (Du Boulay and Medway 1999).

Teaching: Is an act or process of imparting knowledge or skills to someone else. In this study it refers to facilitation of learning in the CSL, with the teaching observing principles of adult principles of adult learning including self–directed learning.

Learning: Is an understanding of information gained from the teaching learning process.. In this study it is the process where students are engaged in the process of learning, identifying gaps in their skills, by actively identifying relevant learning resources, engaging with these resources until they feel competent and ready to be assessed by their facilitators.

Nurse educator: Someone who is skilled in teaching nurses. In this study it means lecturers and clinical educators. These ensure teaching and learning of students in the CSL as well as in the clinical setting.

Students: This term refer to some one who attend school, one who studies. In this study it refers to A0 (Bachelor's degree students) which takes four years full time and A1 (Diploma level students) which takes three years for a full time student and four years for A1 in evening program.

Facilitation: It is an act of assisting or making easier the progress or improvement of something. In this study, facilitation means to help the learner forward, to manage a learner focused education process in an outcome based education model.

Literature Review

2.1 Introduction

The purpose of literature review in this study is to present the accumulated body of knowledge regarding clinical skills laboratories. The University of KwaZulu-Natal librarian assisted in the process of identifying databases. Databases used in searching for literature included: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Academic Search Premier, Educational Resource Information Centre (ERIC) and EBSCO. This chapter starts by presenting learning theories that supports the use of simulated CSL. The second part presents the rationale and benefits of using simulated clinical skills laboratories, CSL environment and resources, preparation of educators for facilitating learning in the CSL and lastly facilitation of learning in the CSL. Finding empirical literature was a challenge as there is very limited research in this area in nursing education. Most of the literature was from medical education.

2.2 Learning theories that support the use of simulated CSL

Kneebone, et.al (2004) highlighted that a useful conceptual framework for the learning of clinical skills comes from the work of Lev Vygotsky (1896–1934), a Russian psychologist who described a zone of proximal development (ZPD). According to Vygotsky, zone of proximal development is the distance between

the actual developmental level as determined by individual problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. In other words, the ZPD is that space where guided learning takes place, and where intervention by a teacher will have the greatest potential. Kneebone, et.al reported that as researchers continued to explore Vygosky's work, they extended this into the idea of scaffolding, where a teacher provides help when needed during the teaching learning process but fades into the background when the learner becomes independent. According to these authors, this deliberate withdrawal is a crucial factor in creating the conditions for that maturation which is an essential component of safe practice.

A recursive 4-stage model was later developed from Vagosky's work (Dunphy & Dunphyy, 2003). The phases in this four staged model are not fixed. According to this model learning within the ZPD can be divided into four stages. *Stage one* is where performance is assisted by more capable others. This is a dynamic, 2-way process stage, where the learner's response to teaching assists the teacher to assist. The amount of outside regulation depends upon the nature of the task and the characteristics of the learner. In the early stages, the learner may have a limited understanding, the expert offers directions or modeling, and the learner's responses are acquiescent or imitative. Only gradually does the learner understand the way in which the parts of the activity relate to one another or understand the meaning of the performance. When some conception of the

overall performance has been acquired, further assistance can be given by questions, feedback, and further cognitive structuring. *Stage two:* During this stage the learner carries out a task without assistance from others. However, this does not mean that the performance is fully developed or automatized, simply that control and guidance is provided by the self and not the other. Learners at this stage will frequently talk themselves through a procedure, either internally or aloud. During the third stage performance is developed, automatised and fossilized. The task become fully internalized and is smooth and automatic. Assistance at this stage is not only unnecessary but counter-productive, as it interferes with the internalization process. During the final phase de-automatisation of performance takes place. This leads to recursion back through the ZPD (Dunphy & Dunphy, 2003).

The model by Dunphy and Dunphy (2003) share the similar characteristics with Benner's model; from Novice to Expert model. The *novice-to-expert theory* describes the pattern of knowledge growth from beginner-novice to the expert level. It is believed that the purpose of engaging student in learning in the CSL is to facilitate their development from the level of the novice to that of the expert (Rothgeb, 2008). The stages in this model include the beginner, advanced beginner, competent, proficient and expert stage (Benner, 1984).

Rothgeb (2008) highlighted a number of learning theories that support the use of simulation in nursing. These theories include experiential learning theory,

constructivism learning theory, adult learning theory, brain-based learning theory, social cognitive learning theory and experiential learning theory.

Briefly, Rothgeb (2008) described *experiential learning theory as a theory that is* based on the use of repetition to improve outcomes and create permanent new behavior. This theory suggests that reflective thought; that is either 'reflecting on action' or 'reflecting in action' (according to Schon, 1987) is important in the development of critical thinking and to improve comprehension and performance. Through hand's on experience or learning by doing, the learners develop and improve their level of competence. Experience of the learner according to Dewey (1969) is regarded as central to experiential learning. Dewey states that in experiential learning, there should be interaction between the individual (learner) and the environment. Therefore key variables in experiential learning which are critical for learning to take place include experience, the environment and interaction. According to Dewey (1969), learning in a safe and controlled simulated environment is seen to be conducive to learning clinical skills. In line with this view, Infante (1985) suggests that students need 'time to investigate, discover, make errors and correct those errors' before clinically applying a skill on a patient. Learning through experience in a simulated environment is important to ensure that clinical practice on patients is carried out with a high degree of safety.

A study by Bradley and Bligh (2005) founded that experiential learning forms a significant component of students' learning in the CSC and emphasized on the teaching and learning in small groups, promoted by the social constructivist approach to learning and that constructivism supports the idea of learning through assimilation and accommodation. The study further revealed that Self-directed learning can be promoted within clinical skills centres through the provision of drop-in or appointment-based access to the resources of the clinical skills centre. Similarly, Stark and Fortune (2003) suggested self-directed learning as it encourages students to seek and maximize learning opportunities.

Rothgeb (2008) describes constructivism learning theory as a theory that is based on the premise that a student actively participates in a learning experience, creating an avenue for reformatting knowledge based on the new experience. Commonly, this takes place during group teaching or learning and during peer learning.

Adult-learning theory according to Rothgeb (2008) supports lifelong learning, and identifies adult learners as being generally self-motivated, goal oriented, and relevancy oriented. The students in the CSL have to identify their learning needs through the process of self-assessment. They learn what is relevant to their needs and something they will be able to apply immediately. *Brain-based learning theory* relates to the active processing of experiences, along with expanding from basic to complex experiences. *Social cognitive learning theory* promotes interactive learning, it is based on the interrelationship between behavior, environment, and personal factors, with each factor dependent on

the other. The students in the clinical skills laboratory are also encouraged to work as groups and peer support and assessment is encouraged.

2.3 The role of simulated clinical skills laboratories

According to Ahmed (2008), the primary role of the clinical skills centre is that it offers an innovative learning method that efficiently fills the gap between theoretical knowledge and clinical practice (Ahmed, 2008). Harden, et al (1999)'s study revealed that CSL provide students with a supportive environment. In this environment, appropriate professional attitudes are displayed; feedback and student welfare is recognized as an important ingredient to student success. Furthermore, the CSL afford students and opportunity to study at different times and pace and is able to cater for the learning needs of different students (Harden et al., 1999).

The work by Medley and Horne (2005) revealed that the simulation environment which exposes students to simulated experience enhances the learning of clinical skills by providing knowledge, skills, and practice that is closely similar to that in real life settings. In line with the above authors' work, Du Boulay and Medway's (1999) study revealed that the CSL provides a simulation of reality so that the reality can be better understood, explored and practiced. These authors postulated that new and advanced skills may be practiced in a simulation setting to afford the student the opportunity to focus on learning without the environmental destruction of a clinical setting.

Literature revealed patient safety as one of the reasons for adopting CSL (Kneebone, Scott, Darzi1 & Horrocks, 2004; Wood, 1994; Ziev et al., 2000). According to Kneebone et al. (2004) simulation offers a safe environment within which learners can repeatedly practice a range of clinical skills without endangering patients. In their view comprehensive simulated environments appeared to allow a move away from isolated tasks to more complex clinical situations, recreating many of the challenges of real life. Ziev et al. (2000) highlighted that many undergraduate curricula and postgraduate training programs have attempted to address patient safety by developing simulation based training programs for risky procedures and by using simulation facilities to explore ways of reducing medical error. According to these authors simulated environment provides a safe environment for practice and promotion of patient safety.

James and Cooper's (1996) recommended the use of a CSL because it provides opportunities for students to learn and practice skills in a controlled environment on models and mannequins, before they have to perform them on patients. Furthermore, in this environment, the students are able to perform back a skill after being talk until they master it. Wood (1994) sharing the similar view highlighted that there is a wide variety of realistic simulation models that may be useful for procedures which maybe painful, embarrassing, difficult or harmful to

vulnerable patients. These models may be used to practice therapeutic skills such as injections and suturing.

The work by O'Brien, Haughton and Flanagan (2001) pointed out that changes in the health care delivery have contributed significant barriers to delivery of clinical education. These changes brought about limited access to clinical learning opportunities. However, improved understanding of adult learning and reforms to curricula has stimulated a rapid development and expansion of simulation based training facilities. According to O'Brien, et al (2001), simulation based teaching methods allow better integration of theoretical teaching and clinical experience, less reliance on serendipitous clinical exposure and increased emphasis on communication skills, teamwork, procedural skills and patient safety.

In line with O'Brien's work Morgan (2006) study suggested that CSL facilitated integration of theory to practice. Morgan (2006) conducted a study that was aimed at establishing if the sessions taught in the clinical skills laboratory prior to the first placement helped students integrate theory to practice during their first practice placement. This study was triggered by the debate regarding theory–practice integration. The participants in Morgan's study identified that sessions taught in the clinical skills laboratory before the first practice placement, which they identified as 'basic nursing skills such as taking and recording vital signs and hygiene needs of patients were useful and helped them to integrate theory to practice during their first practice placement. A conclusion was made that the use of teaching sessions in the clinical skills laboratories, enabled students to link

theory to practice during practice placements. The findings from the study by Wellard, Woolf and Gleeson (2007) contradicted however the view that CSL facilitate integration of theory to practice. According to these authors, there is little empirical evidence about the role played by the CSL in students' learning and how they assist in linking theory to practice.

2.4 Clinical skills laboratory environment and resources

Dent et al (2001) described how to set up a CSL by using a variety of simulated venues. According to these authors, CSL are able to accommodate an increasing number of students without jeopardizing patient care and well-being in busy clinical situations. They explain that a simulated consulting room for student practice in initial patient contact can refer to colleagues or simulated patients or can provide a realistic environment with multiple beds for simulated patients or manikins. Dent et al (2001) argued that a range of patient-care procedures can be practised independently or within a multi professional group. A simulated procedure room that is suitably equipped to practise side-room tests or application of a plaster-cast and a simulated intensive care/resuscitation unit for emergency care procedures can be realistically equipped for more advanced simulations and can be created to simulate working with colleagues in stressful situations. Moreover, they maintain that a simulated domestic environment can be created to simulate a home visit with its attendant hazards, chaos and limitations for clinical interaction. Finally, they suggested that these simulations can provide an opportunity to practise clinical skills in an

environment more closely resembling general practice. These authors further emphasised that in the CSC replication of reality as closely as possible is ensured through the environment and equipment and allow students to learn trough critical problem solving (Ahmed, 2008).

Ahmed (2008) indicated that educational resources for skills centers include simulated patients, videotapes, mannequins and simulators, simple anatomical models, computer –assisted learning, interactive videos, dolls, models. Video and CD ROM can be used to learn communication skills. Posters and notice boards can be used to display different useful materials for easy and quick revision. The internet can have a significant contribution to learning of skills trough displaying words, sounds and pictures with great flexibility. Internet has superseded other means of communication by overcoming the barriers of distance, time and personal schedules. (Ahmed 2008)

According to Greenhalgh (2001) increasing use of appropriate computer learning programs would help students achieve their learning objectives. Virtual reality simulators suitable for training in clinical skills are also envisaged by Issenberg *et al.* (2001). According to Medley and Horne (2005), many types of simulation equipment used in the CSC can help educators and students by teaching and learning simple clinical skills to a very advanced reality based scenarios from the clinical setting. This author differentiate high fidelity as a degree of accuracy duplicated by the simulation compared to the real experience whereas the low fidelity models challenge students to make clinical decisions.

Other innovations in clinical learning include the development of interprofessional training wards within clinical settings, where students from a number of disciplines work together to plan and deliver care (Freeth et al., 2005] and Fallsberg and_Hammar, 2000). Rystedt (2002) investigated the use of simulation for registered nurses becoming nurse specialists in intensive care. He concluded that although simulation is valuable, at the same time there is a crucial need for developing methods for supervision of students.

The experience can be reproducible, standardized, structured and objective and provide the opportunity for performance assessment and debriefing. Ziv et al. (2000) have described the range of simulators currently available for use in the CSC Models and manikins: manikins is familiar with low-tech simulators such as anatomical models for practice in intimate procedures but screen-based simulation illustrating most body systems are now available providing auditory, visual and text-based programmes with feedback features suitable for self-learning (Bloemendaal et al., 2000).

2.5 Staff support in the teaching and learning in the CSC

Dent et al (2001) examined current trends and future implications in the developing role of clinical skills centers and found that the adoption of a more independent learning style in the CSC requires an adequate system for student support. Students cannot be expected to study effectively in isolation without access to members of staff who are competent facilitators of learning in such an environment. These authors further emphasized that because high fidelity

simulation are very sophisticated, faculty member need time and instruction to become skilled in teaching with such models, to explore methods of application and to develop scenarios.

According to Dent, et al (2001) faculty support can be augmented with technical and laboratory assistant personnel for videotaping and laboratory set up. The staff members can also role play non health care personnel. Simulation does not necessarily decrease faculty assignment time, but it does provide comparable learning experiences across students, safe and realistic challenging situation for students to develop clinical decision making skills.

Harden and Crosby (2000), advocated for formal training of clinical teachers if the institution intend to adopt a more independent learning style which requires a system for student support. A study conduct by Bradley and Bligh (2005) reveals that teachers continue to play a vital role in helping students gain experience and skills through observation, feedback and role modeling while facilitating students in the CSC.

2.6 Learning process and teaching strategies

In the traditional nursing skills classroom, the instructor teaches about theory and the rationale for particular skills and follows an explanation of the related theory. A skill is demonstrated by a clinical instructor or instructional media and students, then practice the skill with feedback from the instructor (Jeffries, 2000). Nyuswa (1999) noted that the educational paradigm over the past decade was teacher-centred, with the student being the passive recipient. Outcomes of this

learning failed to exhibit a critical thinking of individual, capable of adequate decision making practice. In the study by Nyuswa (1999) the learning process emerged as different in a self-directed clinical skills laboratory. It promoted experiential learning and needs-based learning where students independently choose learning packages or material that will allow them to practice skills that are in line with the gaps in their practice. The teacher takes a back seat, not a leading role, allowing the students to take an active role in their learning. They serve as resources for students (Nyuswa, 1999)

According to Govender (1997), the teaching methods commonly used for teaching psychomotor skills are through demonstration by an individual in a setting, by films or by multimedia methods. Whatever methods are used for demonstration, this author stressed that the practice is essential in developing coordinated efficient skills performance. Simulation is the predominant strategy where students are provided with a range of simulated or mock experiences to engage in both directed and self-directed learning and performance of clinical nursing activities (Wellard , Solvoll and Heggen,2008)

The use of videotapes and videotaping in teaching clinical skills to nursing students is not new. Most schools of nursing have extensive holdings of commercially produced videotapes demonstrating various skills. Wellard and Woolf (2007) reported the use of video taping to provide feedback on skills performance, either as student self-directed activity or as teacher centered clinical laboratory learning regarding psychomotor skills performance by students. Videotaping of instructors demonstrating various skills as a supplement

to learning clinical skills was suggested by Nicol and Fox-Hiley (1996) in order to enable students to review the taped demonstrations at their leisure and as many times as desired. Although initially time-consuming to make and edit audio/video is noticed, Dent and Priece (2007) highlight that they are valuable resources which facilitate teaching with large student numbers.

Corner (2005) mentioned the role play as a support range of student learning styles within CSL. The main advantage of role plays highlighted by Cooner (2005) is that it is a cost effective method of learning clinical skills when compared to the cost of using technological simulation.

A number of nursing education programs have moved away from traditional methods of teaching to innovative methods such as problem based learning (PBL). PLB has been recommended as one of the methods of teaching because of its focus on practice, local problems, self-directed and critical thinking (Heliker, 1994; Majumdar, 1998). Bradley and Bligh (1999) therefore asserted that the CSL can be used to complement a problem-based learning program. Ewan and White (1996) clarified that in self-directed learning, students learn at their own pace and time, and thus become more independent in this approach. Nyuswa (1999) stipuleted that the development of skills necessary to become a self-directed and lifelong learner is based on the belief that teaching should encourage facilitation rather than the passive instruction of students. This method of learning allows a student determine her/his own learning needs and objectives in negotiation with a facilitator. Furthermore, Medley and Horne (2005) conducted a study on the use of simulation technology for

undergraduate nursing education. Their results revealed that teaching through simulation can make use of variety of methods and techniques according to equipment available and the skills to be performed by the student. These authors mentioned the relevance of role play, peer modeling and skills review as strategies to ensure learning in the CSL.

According to Harden et al. (2000), a task-based approach where a list of appropriate tasks for students to master is identified and sufficient time and resources have to be available in the CSL for supervised or independent learning until mastery is achieved. This author states that whatever approach is used, the CSL program should provide both vertical and horizontal integration and ensure that all students receive the same content whenever they attend or whichever tutors are present.

According to O'Nell, (1996), a learning process can not be dissociated with the assessment method. O'Nell(1996) pointed out that in both medical and nurse education the OSCE is the assessment method used in the CSL. It has been further proved by Bartfay, Wally, Rombough, Rosemarie, LeBlanc, Ruth (2004) that OSCE is a powerful tool for teaching clinical nursing skills and evaluating clinical competences. Self-videoing of their interviews with patients followed by independent reflective review or by peer or tutor feedback is a powerful learning technique (Dent, 2001). Conversely, live audio-video links to adjacent rooms can allow a student group and tutor to have simultaneous remote observation of each other's interaction with a patient situated elsewhere. The repetitive critique of each other's performance and the opportunity for the tutor

supervision has been positively received by students as a formative experience (Dent, 2001).

2.7 Management of the CSL and its staffing

According to Hafce (1994) good management and quality control are essential for the effective running of a skills centre. Staff should be available to manage the room and equipment bookings, address enquiries and act as a general liaison point (Hefce, 1996).

In a skills laboratory, clinical skills coordinators are usually appointed .Their main role is to evaluate the ongoing development and use of CSC resources. Similarly, Ahmed (2008) stipulated that the duties of administrative team (coordinator, a secretary and technician) include scheduling, timetabling, examinations arrangement, maintenance of equipment and financial issues. He further argued that a higher committee from concerned departments can be responsible for planning and evaluation of activities of skills centre. It should be noted that the teaching staff appointed as a coordinator must be a lecturer with interest in teaching clinical skills, and that her/his role is not a substantive post. Therefore, the coordination of a skills laboratory is an addition role to their principal role. According to Cahill (2001), this role was increasingly acknowledged as overburdened. The main role of the CSL coordinator is advancing clinical initiatives in the school. One of his or her tasks is to produce a policy and procedure manual to ensure safe, appropriate use, maintenance and smooth running of the facilities (Cahill, 2001).

According to Ahmed (2008), each CSC needs a qualified staff for students' teaching and administration of the centre. The teaching staff can be a mixture of full time tutors to ensure continuity of the teaching programs, and part time facilitators. It includes people with expertise in medicine, clinical skills, communication skills, information technology, nursing and midwifery. Nyuswa (1999) asserted that part of the clinical skills coordinator's responsibilities is to ensure that students make booking to reserve space and to ensure that effective learning takes place. The students according to Nyuswa had to pre-book a station in the laboratory for control purposes and to avoid unnecessary competition over learning resources.

2.8 Benefits of the CSC

Ahmed (2008) indicated that in the CSL the student have opportunities for immediate feedback as they learn under the guidance of the facilitator. Opportunities of immediate feedback enhance the effectiveness of skills teaching (Ahmed, 2008). Skills need to be practised and reinforced soon after teaching. A clinical skills resource provides opportunities for students to learn and practice skills in a controlled environment on models and mannequins, before they have to perform them on patients. A wide variety of realistic simulation models are now available, especially useful for painful and embarrassing (du Boulay and Medway, 1999). Similarly, Amed (2008) started that the CSC provides a protected learning environment with no concern of distress that traditional teaching (patient encounter) might cause to real patients. The

laboratories in both settings reinforce the hospital as the nursing practice environment, and students are expected to dress in the laboratory as they would if in a hospital setting.

According to Medley and Horne (2005), in the CSC, clinical setting can be realistically simulated and there is no threat to patient safety .These authors further stressed that the CSC offer an active learning and a specific patient simulation can be presented. Errors can be corrected and discussed immediately, consistent and comparable experiences can occur for all student. Similarly, Wellard , Solvoll and Heggen ,2008) argued that safety is often an important reason for using simulated experiences, because students can develop a level of competency in skills prior to providing direct care for patients. In addition Freeth and Fry, (2005) stipulated that the skills laboratories provide a safe learning environment for students where they can test and practice their skills without the pressure of real world performance. These authors further stated that the advantage of simulators allocated in the CSC is that, unlike patients, they can provide learner-centered education without risk to patient safety. They give tutors the ability to control the structure and complexity of the learning environment and give students the opportunity to make mistakes without detrimental consequences.

According to Eaves and Flagg (2001), teaching and learning in the CSC offers an excellent approach for developing interactive critical thinking. He further stressed that the CSC teaching and learning is an exercise which develops competence in skills, priority setting, and organization of care, leadership and

delegation. The clinical skills resource can bridge the gap between the classroom and the clinical setting as it provides opportunities for students and staff to practice and update their skills in safety and plays an important part in making the transition to the real setting as smooth as possible, to reduce the reality shock of entering clinical practice (Elkan and Robinson, 1994). Whaite et al., (1999), confirmed that CSL provides positive experiences of self-directed learning (Nicol, 1999; Jeffries et al., 2002). 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.

Hao et al. (2002), was 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) agreed that CSC allows the learner to appreciate the consequences of their actions without causing any harm to the patient. It also allows learners to practise 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 practise 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 CSL 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).

Medway and Du Boulay's (1999) study on the clinical skills resources reveals that Safeguarding patient welfare and providing first experiences for students always present a conflict. Thus, it is only in the real clinical setting that students can feel the real complexity of professional practice. Many studies suggest that students feel ill-preparation for the practice and the teaching of many skills which could be enhanced by using skills laboratory prior to real patient contact. Moreover, students can practice and rectify mistakes without risk to patients and with minimum risk to themselves, ensuring that newly qualified practitioners can handle the situation (Department of health, 1994).

Many undergraduate curricula and postgraduate training programmes have attempted to address patient safety by developing simulation based training programs for risky procedures and by using simulation facilities to explore ways of reducing medical error (Ziv et al., 2000). These authors confirm that simulation in a CSL allows students to achieve a level of competence and safety before attempting a technique or procedure on patients. The findings of the Medway and Du Boulay's (1999) study findings further indicate that learning in the CSL enables trainees to make mistakes without adverse consequences. Kohn (1999) highlighted the role of simulation based in CSL as an important method of improving the safe delivery of medical and nursing clinical learning.

Du Boulay and Medway (1999) point out that the CSL can help to reduce students' anxiety and protect patients. As described by Peterson and Bechtel (2000), clinical environments are the key benefits of an intensive clinical skills experience. These authors argue that the CSL may permit students to achieve a level of competence and safety before attempting a technique or procedure on patients. Moreover, the skills laboratory can help trainees in all health science disciplines in skills development and can also provide an environment conducive for multidisciplinary teaching to promote development of teamwork skills. In addition, they can be used as sites for clinical examinations (Rees and Jolly, 1998).

Hammond and Collins (1991) claim that the skills laboratory can promote active and self-directed approaches to learning. They report that the teaching laboratory skills can enhance the activation of prior knowledge and its application to other settings. Moorthy et al. (2005) assert that a skills laboratory is interactive and occurs within realistic environments. This can allow the learner to appreciate the consequences of their actions without causing any harm to patients. It can also allow learners to acquire how to handle crisis or emergency situations. In other words, the become prepared to deal with them in real life. According to Alvernia (2006), nursing skills laboratories provide a supportive and caring environment for students to practice and demonstrate their skills before moving into the practical setting with patients. Alvernia (2006) maintains that CSL provide 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 and, in turn, increases confidence and may even be viewed by learners as fun (Morgan, 2006).

This increased confidence can allow students to broaden the scope of their learning and enrich their clinical experience. CSL have been used to pilot inter professional education initiatives with students and staff viewing these as positive and worthwhile (Barrington et al., 1998). The use of CSL for formative and summative assessment, using objective Structured Clinical Examinations for example, has gained acceptance (Nicol and Reeth, 1998; Watkins, 2000). According to Issenberg et al. (1999), the skills laboratory allows high fidelity simulators for clinical training which have a number of benefits, including improved teaching of a wider range of skills, clinical risk reduction, cost savings and the ability to assess previously trained practitioners' skills. Therefore, the skills laboratory provides for the development of teamwork, planning and decision making skills, and for instruction in effective use of technology (Kennedy, 2001).

Morgan et al. (2002) stressed that skills laboratory provides opportunities for experiential learning, education in management of critical or rare events and promotion of patient safety. An increased understanding of how adults learn has emphasized the importance of presenting a more active and independent style of learning .Opportunities for self-directed learning when students can study at their own pace, in their own time and in other places can now be made available by the CSC program. Appropriately constructed study guides facilitate a variety of learning styles and help to integrate theoretical material presented elsewhere in the course or in a previous year (Vaughn et al., 2001).Clinical skills

and practical procedures are thus learned in tandem with theoretical components of the course.

According to Dent (2001), CSCs are able to accommodate an increasing number of students without jeopardizing patient care and well-being in busy clinical situations. This author added on that the CSC provide training opportunities through a variety of simulations for communication skills, examination technique and practical procedures and avoids patient care being compromised by teaching students in clinical venues.

While focusing on the CSC strengths, a study conducted by Parsell, Bligh (2001) found that the CSC focused on real problems in the context of professional practice and learners are motivated by its relevance and through active participation. They further mentioned that in the CSC, professional thinking, behavior, and attitudes are modeled by teachers and it is the only setting in which the skills of history taking, physical examination, clinical reasoning, decision making, empathy, and professionalism can be taught and leant as an integrated whole.

The clinical skills centre can promote active and self-directed approaches to learning and the early teaching of skills can enhance the activation of prior knowledge and its application to other settings. Opportunities for role playing clinical scenarios as well as leadership, management and decision making activities, together with computer assisted learning can encourage interaction between theory and practice. Both group work and individual learning experiences can be offered (Du Boulay, 1999).

According to Clarke , (2002), CSL facilitate the development of' real practice in clinical placements, facilitate students to self-evaluate their competence prior to clinical placements, support the teacher-practitioner model, allow students to practice skills without fear of harming patients, develop student self confidence in the use of psychomotor skills without fear of failure , allow students to achieve a pre-defined level of competence, facilitate formative and summarize assessment, potentially enhance the teacher's credibility. In addition to the clinical skills that may be developed through the use of a simulated clinical environment, key skills to augment nursing practice may also be developed, such as team work, management and communication.

According to Paparella, Bette, Layton, Carpenter (2004), Simulation exercises as a methodology for educating nurses has been proclaimed by some educators as one of the most effective teaching strategies known and it has been used extensively and very successfully over the last several decades in nursing to teach a variety of clinical as well as psychosocial skills. They further said that Simulation exercises are ideal for the adult learner who desires a degree of self-directed learning and for those individuals who learn problem-solving skills best through real-life situations. As with other types of gaming, nurses trough simulation integrate theory into practice and bridge the distance between written policies and procedures and realities in clinical situations. Simulation is intended to help nurses practice decision making and problem solving skills and to develop human interaction abilities in a controlled, safe setting, they

emphasized. Nursing staff can benefit by achieving cognitive, affective, and psychomotor outcomes in a setting that is realistic, but not harmful to the patient when a wrong decision is made or an incorrect action is taken .Although simulation requires a great deal of preparatory effort by educators and a less structured learning environment, it is considered motivating to the adult learner and a preferred educational approach by nurses (Paparella, Bette, Layton, Carpenter, 2004).

According to Maddox (2001) study, using simulation to teach safety principles is an overwhelmingly positive and worthwhile experience and educators share in this concern and are committed to the prevention of errors through comprehensive and creative educational programming, where learning about safety can be fun.

Ramsay (2008) conducted a pilot evaluation of the role of a CSL and the use of simulated patients for a communication skills exercise. The results concur with those of other studies on communication skills education in different contexts, Eagles et al (2001). Trainees in these studies rated simulated patient sessions as effective in acquiring interviewing and communication skills when focusing on health risk and treating patients. But the results confirmed that simulated patients used in the CSC cannot replace learning from patients in clinical practice situations, but it use help students rehearse potentially sensitive communication challenges in a safe environment.

According to a research by Ker, Molel and Bradley (2003), on early introduction to interprofessional learning, it results confirmed professional skills with students and nurses, such as collaborative team working, Leadership, Competence in clinical performance, communication skills, behaviours of responsibility, respect for boundaries, time keeping and organisational skills. The results of this research further shown that a simulated ward environment was a first attempt to create a realistic, clinically based, interprofessional exercise for junior medical and nursing students .It was widely acceptable to both groups of students and promoted collaborative working and learning. The development of a controlled, structured and realistic clinical environment provides a useful step in the development of confidence and competence in interprofessional working for clinical practice. The simulation was seen as a safe and realistic environment which enabled learning without compromising patient care. In addition, the exercise has proved to be sustainable For the observers, the exercise demonstrated the enormous potential for clinical learning in a realistic and safe environment. Observation of interprofessional working could be combined with time allocated for feedback to the students, thereby maximising their learning. Being able to focus for the duration of the exercise on the students' performances identified the strengths and weaknesses in both curricula. This has implications for both teaching and learning in other elements of the curricular programs.

Shahid (2006) conducted a study in a school of medical sciences to explore the need for clinical skills lab training and available resources, the results indicated that though the clinical skills lab is expensive facility to establish, its utilization

under a well defined curriculum was essential for informal transferable learning environment. While stressing on the learning process, tutors and clinician student's support in the CSC, Bradley et al. (2006) conducted a survey of students' perceptions of nurse tutor teaching in a clinical skills centre. The results demonstrate that nurse and clinician tutors are both highly valued by students in respect of clinical skills training. There was no significant difference in their ability to generate interest, support student by focusing on the learning objectives. The results of this survey further indicated that students were explicit in their recognition of the teaching role taken on by the nurse tutors. They were seen to be effective in their teaching role and to be suitably qualified to undertake it. They also indicate that nurses and clinicians are equally appreciated as teachers of clinical skills. Interestingly, they are markedly against the concept of only clinicians providing teaching in this learning environment.

2.9 Limitations

Kneebone et al. (2004) highlighted one of the limitations of using simulated environment. In their work they pointed out that simulations can operate in isolation from the clinical context, ignoring the learning needs of individuals within a real health care environment. These authors recommended that, in order to realize the CSL full potential as a learning aid, simulation must be used alongside clinical practice and linked closely with it.

According to du Boulay and Medway (1999), real clinical experience has always been at the heart of healthcare education and a clinical skills centre should act only as an adjunct to essential clinically based experience. They further stated that a clinical skills resource should supplement clinical experience and can never replace it. Some aspects of professional learning can undoubtedly only be passed on through personal experience in a variety of real practice settings. The conditions for closed skills are easy to replicate in a learning centre, and it is more difficult to capture the more complex and dynamic conditions which characterize most of real practice. It has been argued that the skills centre enables students to feel safe to commit errors without the fear of reprisals. It is therefore important to recognize the limitations of preparation outside the real setting. Simulations are not as good as practicing on the real thing', but are certainly better than having no opportunity all and are a useful stepping stone to some of the more complex or intimate skill areas.

Childs (2002) undertook a national survey investigating the physical structure, resources s, budget and administration of clinical laboratories in nursing schools in the USA, finding a range of supports used to assist directed and self-directed student learning. Barriers to successful use of laboratories included mismatches between curriculum and resources, and issues associated with available and appropriate staff, space, equipment and technology.

The study by Friedman, (2000) revealed that the content of clinical skills sessions may still follow traditional educational models and be stuck in time, space and content. According to Freeman (2000) the session may be tutor-centred, only

available at a specific time and venue and may not always be integrated into the remainder of the course or with student needs. Student attendance may be voluntary and mastery of clinical tasks, once these have been identified, may not always be assessed objectively. Friedman further indicated that the opportunities to learn together with students from other healthcare disciplines are uncommon and relatively under-explored.

The study by Stark and Fortune (2003) on teaching Clinical Skills in Developing Countries, revealed that it is important to realize that there are still costs to implementing educational change whether or nor a Clinical Skills Centre is established. Those expenses centre on staff development, the reduced clinical activity during teaching sessions and administrative costs associated with monitoring evidence of skills acquisition.

2.10 Conclusion

The literature referred to in this chapter reflect the teaching and learning in CSL, how it can be organized, it benefit, it limitations and implications of teaching and learning in such settings. Surprising, little is said about from the users' reflections. Student nurses and nurse educators' voices are very limited in literature. Most of the studies were conducted in medical education. The contribution of this study is to address this gap partly. In other words, as mentioned previously, this study will explore the perceptions of students and nurse educators with respect to how teaching and learning take place in CSL. My contribution will be also to carry out this study in a context of higher learning

institutions in Rwanda where, to my knowledge, no similar research has been conducted so far since the introduction of the CSL in 2006.

Research design and methods

3.1 The paradigm and approach

The positivist paradigm, sometimes known as logical positivism served as guide in the study. The positivist' scientific approach involves the use of orderly, disciplined procedures with tight controls over the research situation (Polit and Beck, 2008). A quantitative approach which is closely allied with the positivist tradition was used. Quantitative research is a formal, objective, rigorous, systematic process for generating information about the world. It is conducted to describe new situations, events or concepts in the world (Burns and Grove, 1999), which makes it appropriate to this study which was aimed at exploring a phenomenon for the first time; that was, exploring the perceptions of students and nurse educators about teaching and learning in the CSL in KHI.

3.2 Research design

A descriptive, exploratory design was used in this study. A descriptive design was used to get more information about characteristics within a particular field of a study (Burns and Grove, 1999). The descriptive design may be used for the purpose of developing a theory, identifying problem with current practice,

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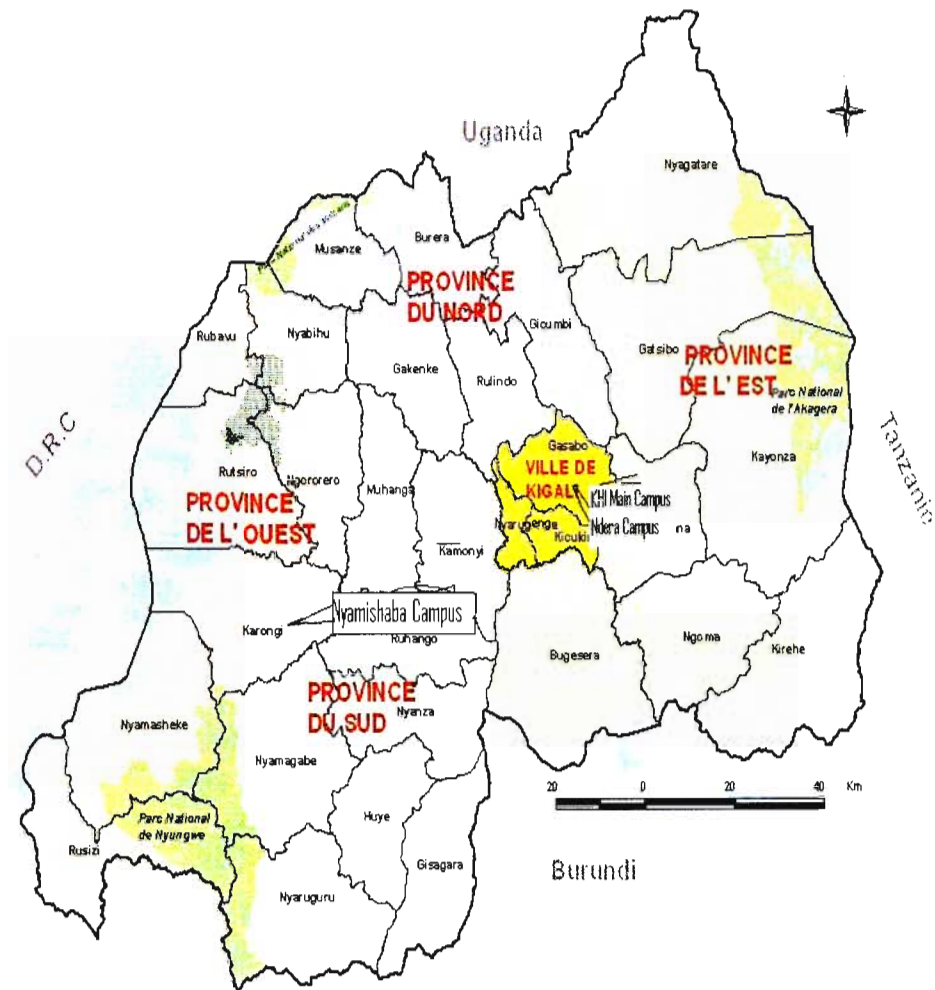
Figure2: Rwanda Map

Kigali Health Institute has three faculties: (a) Faculty of health Sciences (b) Faculty of allied sciences (c) Faculty of community.

3.4 Population

Polit and Beck (2008) define a population as all the individuals or objects with common, defining characteristics. The population in this study comprised of

justifying current practice, making judgments or determining what others in similar situations are doing (Burns and Grove, 1999). Furthermore, a descriptive design is used to obtain information on the current status of the phenomena in order to describe "what exist" with respect to variables or conditions. Exploratory design on the other hand, rather than simply observing and describing the phenomenon, investigates the full nature of the phenomenon, the manner in which it is manifested and the other factors to which it is related with the underlying processes (ibid). In this study an exploratory, descriptive design was appropriate to explore and describe perceptions of students and nurse educators about teaching/learning in the CSL

3.3 Research setting

Kigali Health Institute (KHI) is an institution of higher education established in June 1996 by the Ministry of health, in collaboration with the ministry of education of Rwanda. The institute was developed to address the problem of lack of health personal. KHI has three campuses: Kigali, Ndera and Nyamishaba (See Figure 2). A diploma level and a degree level is offered at all three campuses.

permanent nurse educators (consisting of 10 lecturers and 7 clinical educators) and 214 students in the Nursing and Midwifery Department at Kigali Health Institute Main Campus. This population was made of 2nd and 3rd year general nursing day programA1 (162 students) and 54 from A0 day program. From the total sample, 117 were from day program and 45 from evening programme. First year students were not part of the population under study because they were staying at Kibuye campus (which is a satellite campus) and have their own clinical skills laboratory. They never use Kigali campus clinical skills laboratory during first year. The two clinical skills laboratory (Kibuye campus and Kigali main campus) are different in standards and management. The total number of students registered in the nursing and midwifery programs for diploma level and degree level, day and evening program at the KHI main campus for the year 2008 were 214.

3.5 Sampling and Sample Size

All the 214 students in the study population were included in the study, together with all the 17 nurse educators in the Nursing and Midwifery Department at KHI. All the population was taken as a sample because these students are heterogeneous ,days who are full students who are accommodated to the campus, evening students who are mature nurses with many responsibilities and who have limited time to be to the campus and therefore using the clinical skills laboratory ,A1 students and A0 students are different in background as all A1 are all nurses and A0 accommodate all students from secondary school but

who succeed well at the final examination .As this study is an exploratory one, it has been important to take as big sample as possible and participants consented to be part of the study without any victimization problem.

3.6 Data collection instrument

Data was collected through questionnaires and document analysis. Two instruments/questionnaires were used to collect data; one for the students (Annexure 1) and one for nurse educators (Annexure 2). The researcher modified instruments which were initially developed by Freeth and Fry (2005). Freeth and Fry (2005) generated these items from literature as there was no existing tool. The statements addressed views about learning in the CSL. Themes within this questionnaire included teaching and learning in the CSL, management of the CSL, the CSL environment, self direction, linking theory to practice, safety and learning of clinical skills. A 5 points Likert scale was used to rate the views (strongly Agree, Agree, Neutral, Disagree, Strongly disagree).Some statements in this questionnaire have been modified to suit the context of the current study.

Freeth and Fry (2005) developed the nurse educators' questionnaire guided by the students questionnaire to ensure that they address common areas. Mirror statements are used in these questionnaires, for example, Item I on students' questionnaire reads. "A substantial benefit of coming here is to practice practical skills", and Item 10 on nurse educator questionnaire reads "a major objective of my teaching in the CSL is to allow students as much time to practice

as possible". Items in the nurse educators' questionnaire focus mainly on their approaches to teaching, learning in the CSL and management of the CSL. Demographic data covered students' groups' according to gender, while the nurse educators' covered years of teaching experience and their nursing specialisations. The last part of this questionnaire had three open ended questions, requesting nurse educators to identify the benefits and limitations of learning and teaching in the CSC as well as its management and recommendations to improve teaching and learning in the CSL.

3.7 Data Collection Procedure

The process of data collection began by the researcher approaching the head of the school, obtaining permission to have access to the nurse educators and staff. Once the permission was secured the researcher approached coordinators of different programmes including the coordinators of the clinical laboratory who is also one of the lecturers. The coordinators assisted with access to nurse educators and students. The researcher approached the nurse educators separately as well as the students to explain the nature and purpose of the study and the rights of participants. The researcher obtained consent from participants before they volunteered to complete the questionnaires. To gain access to students, a convenient time to distribute questionnaires was organized with lecturers to meet students after lectures. The students were requested to complete and drop the questionnaires in a provided box on the same day. To

collect data from lectures and clinical educators, appointments were sought to distribute questionnaires to them in their respective offices. The questionnaires were collected from lecturers and clinical educators after two days.

Record review in the Skills Laboratory was done by the researcher using a checklist to look at time tables, reports; student's booking records, procedures and stock inventory (See Annexure 3).

3.8 Validity and reliability

Within this study, content and construct validity was ensured by checking items in the data collection tools against the study objectives and concepts in the conceptual framework to ascertain whether they measure all the elements to be investigated. The data collection tools were also reviewed by a panel of experts in research and in nursing education. To ensure external validity, the sample taken for this study included all the members of the study population. This could allow generalization of the study findings in similar situations. According to Freeth and Fry (2005) the instruments adapted in this study was found to be reliable. The researcher however, piloted these instruments as they were used in different contexts and some items were modified to fit the purpose of this study. The instrument to collect data from the students was modified to suit the Rwandan context. It had 50 items. Cronbanch's alpha test was used to calculate the reliability. It was found to be 0.875.

3.9 Data analysis

After data collection, an SPSS software package version 15 was used to organize and analyze data. Data was analysed using descriptive statistics, frequencies and percentages. Chi-square test, nonparametric analysis tests were performed to determine the relationship between students and nurse educators', day and evening programs students A0 and A1 students' perceptions about teaching and learning in the clinical skills laboratory.

Chi-square test was performed to explore the relationship between day and night program student's views, Mann-Whitney test was used to identify items producing significantly different responses between A0 and A1 and Kruskal Wallis test was performed to explore the relationship between students and nurse educators' views of the teaching and learning in the clinical skills laboratory.

3.10 Data management

Data from the study was only used for the purpose of completing this study. Crude data was guarded confidentially in a locked place and will be burnt after a period of five years. Analysed data was saved in computer files, secured by a security code that is only known to the researcher.

3.11 Ethical considerations

Nursing research must not only have the potential to generate and refine knowledge, but must be ethical in its development and implementation (Burns and Grove, 1997). Therefore prior to conduct the study, the research proposal was presented to the University of Kwazulu Natal's Research committee for approval. Permission was sought from the KHI scientific and research committee. After obtaining permission from KHI to conduct the study, the consent form was stated, the aims and the purpose of the research and requests participation in the study. Participation in the study was voluntary and participants were free and no participant withdrew from the study although it was guaranteed. No identification details were required as a measure to ensure anonymity. All given information was kept anonymous. The significance of the study was explained and its purpose was clearly explained to participants so that a mutual consent is obtained

3.12 Limitations of the study

The following were limitations of this study:

- ❖ The generalization of the findings were limited due to the nature of non probability sample
- ❖ The results of this study were analyzed at KHI level, thus, they can not be inferred to other institution in Rwanda or outside Rwanda.

Data Analysis and Findings

4.1 Introduction

This chapter presents the results of the study, starting with demographic data followed by data obtained from the students and the data from the nurse educators. The researcher used two structured questionnaires with three open ended questions at the end; for the nurse educators, with the aim of exploring the perceptions of nurse educators about teaching and learning in the clinical laboratory in Kigali Health Institute. Data were analyzed using Statistical Package for Social Science (SPSS) version 15.00 for windows. Frequency distributions, mean, standard deviations, as well as cross-tabulation were done during the process of data analysis. The responses 'strongly agree' and 'agree' were grouped into agree and the responses 'strongly disagree' and 'disagree' into disagree. The responses of students from both programmes (day and evening programmes) were grouped where there was a need to compare the responses of the students with those of the nurse educators. Mann Whitney and Kruskal Wallis statistical tests were performed to ascertain association between variables of interest. These tests were used to determine the relationship between A0 and A1 students, and to determine the relationship between students (both A0 and A1 grouped together) and nurse educators' perceptions about teaching and

learning in the clinical skills laboratory. Differences in the responses of A1 and A0 students were explored using Mann-Whitney test which indicates whether the level, spread or emphasis of responses differs between groups (Polit & Beck, 2008). The Kruskal Wallis test was used to establish the association between the students and nurse educators' responses. A chi-square value obtained at a p value less or equal to 0.05 was considered to denote a significant difference between variables under investigation. Data obtained through observations and from documents was analysed qualitatively, where frequently occurring themes were grouped together.

4.2 Sample realization

Two hundred and fourteen students participated in this study. Of these 214 students, 162 (75.7%) were from the A1 programme and 52 (24.2) from the A0 programme. According to this sample size the sample was skewed towards the A1 group. Of the 162, A1 programme students, 117 were from the day programme and 45 from the evening programme. All A0 students (n=52) were from the day programme (See Table 1).

Table 1: Student Population and Sample Size

Program	Group				Total	
	Frequency		Gender			
	A1	A0	Male	Female	Frequency	%
	Freq	Freq				
Day	117 (69.2%)	52 (30.7%)	70 (41.4%)	99 (58.5%)	169	100%
Evening	45 (100%)	0	8 (17.7%)	37 (82.2%)	45	100%
Total	162 (75.7%)	52 (24.2%)	78 (36.4%)	136 (63.5%)	214	100%

About 78 (36.4%) of the students were males and 136 (63.5%) were females. The ages of students that participated in this study from both groups (A1 and A0) ranged between 22 and 55 with the mean at 27.81. This means the relationship of central tendency is asymmetrical and the scores are showing a positive skew (See figure 1).
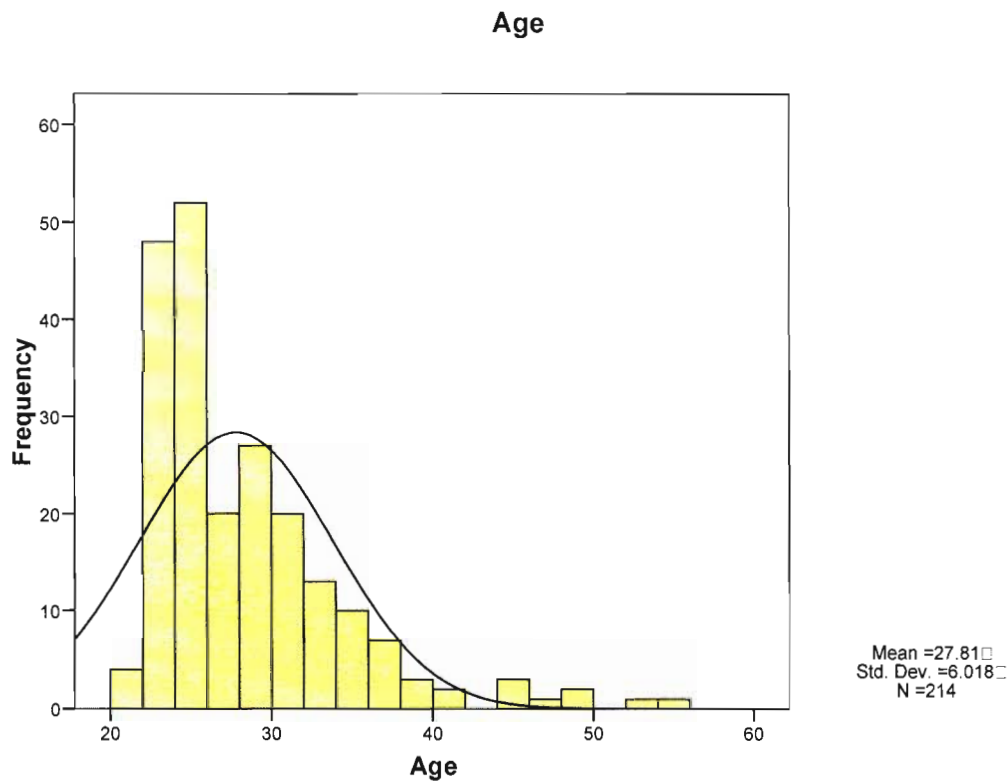
Figure 1: Students' Age

Demographic data of teaching staff

About 17 staff members completed questionnaires. About 59% (n=10) of the teaching staff were serving as nurse educators and 41% (n=7) as nurse clinical instructors. Their ages ranged from 27 years to 45 years. The mean age was 35.76. The findings also showed that of the 17 staff members 12% (n=2) of them had an experience that was above 72 months and 47% (n=8) of the total sample had an experience that ranged between 37 to 72 months and the rest of the sample (n=7; 41%) had an experience of more than 72 months. About 88% of staff was teaching in both A0 and A1 programmes and only 12% were teaching in A1 programme.

4.3 Perceptions of students and nurses educators about teaching and learning in the CSC

4.3.1 Antecedents of effective Teaching and Learning in the CSL

The items that established the views about antecedents included (a) the location (place of position) of the clinical skills laboratory, (b) the availability of learning resources; that is tutors teaching in the CSL and learning materials, (c) hours of operation of the CSL, (d) scheduling times for using the clinical skills laboratory, (e) making bookings for using the CSL, and (f) administration of the CSC.

The students from both day and evening programme agreed (n=169; 77.9%) that KHI Clinical laboratory is located in a convenient space and this has an influence on the use of the CSL. The mean for the A1 group was 4.06 and the standard deviation was .926. The mean for the A0 group was 3.76 and the standard deviation was .930. The results showed a p value of 0.050 when comparing the results of the students from the day programme with those from the evening programme. The p-value was lower than the expected. The researcher also observed that the CSL at KHI is situated at the 5th floor but in the same building as the classrooms. The Mann Whitney Test also showed a significant relationship in the responses of students from both programmes with a p value of 0.25. The results therefore showed that both groups view the place where the CSL is located as important for the students to be able to use the CSL. Nurse educators while stipulating the benefits of the CSC, pointed out that the CSC location help students and themselves enjoy the teaching and learning in the CSC.

The **availability of learning resources** was another important factor for effective use of the CSL. The students from both programmes agreed and (n=174; 81.3%) that they needed to handle real equipment in the CSL and that was important for their learning. The relationship between the day and evening programme students showed a p value of .188 (the minimum expected count was set at 1.05). The students also agreed (n=120; 56.4%) that they required mannequins in the CSL as it will help them develop skills. Staff as well as students agreed that mannequins are realistic enough to help develop students' skills. The researcher also noted a number of resources available for the learning and made a list of these (see annexure 5). Annexure 6 also showed a list of available learning packages and where they are stored.

Regarding the availability of human resources, students from both groups agreed (n=161; 75.3%) that they come to the clinical skills when there are tutors to teach them. The Pearson Chi-square test showed a relationship between the responses of the students from the day program to those of the students from the evening program and Mann Whitney test was performed to see differences between different group of students and was find significant (p.value=0.025).

Pre-booking the learning station in the CLS emerged as another important pre-requisite for learning in the CLS. Data sources revealed that the teaching and learning process in the CSL was done through a process of booking and learning sessions were timetabled. The nurse educators as well as students had to reserve time in the CSL before hand so as to use the CSL and book the procedure to be

performed or a learning package to use. The nurse educator located each day for the CSC arrange everything, material equipment, video and DVDs for staff and students who have booked. The researcher observed that the students can book as a group or individually or a nurse educator can book for a demonstration for the whole class, for coaching a student due to specific weaknesses identified. The students can book for practicing a skills, watching a video for to be evaluated for specific competence. Each activity done is recorded in the CSL report book and student file. (see annex 8). The results revealed that students were supported by nurse educators when they are struggling.

Administration of the CSL: Data source showed that on the top management of the KHI CSL is a coordinator who reports to the head of school. This coordinator works with one administrative clerk which also serves as a technician. The administrative duties of a CSL coordinator included preparing in collaboration with the CSL staff and the department of nursing the annual activity plan and work on the budget for the CSL. The CSL coordinator ensures the smooth functioning of the CSL, conducting workshops regarding facilitation of learning in the CSL for KHI staff as well as for in service nurses, purchase material and equipment for the CSL and ensures maintenance of that equipment. Furthermore, the coordinator of the CSL develops a time table, organize open days for advocating the CSL. He/she organizes meetings and writes reports for the CSL steering committee. In collaboration with staff members and other senior nurses in the country develop training manuals and DVDs for nursing and

midwifery procedures. Lastly, she /he conducts small scale research in this area to improve functioning of the CSL. On the top management of the CSL is a steering committee which monitors and evaluates the functioning of the CSL.

Hours of operation: Through observation, the research noted that the CSL operates six days per week; day and evening hours are covered to help day and evening program students to use the CSL effectively and intensively.

4.3.2 Teaching approaches (strategies) in the CSC

The findings in this study showed that a variety of teaching approaches were used in the CSL to ensure teaching and learning. These include demonstrations by facilitators in the CSL, peer learning, small group teaching and learning, reflective teaching and learning and the self directed learning.

Regarding demonstration, 83.3% (n=15) of the nurse educators agreed that their session always include demonstrating clinical skills. About 75.2% of day program students agreed that demonstration is used in the KHI CSL and 75.6% of evening students also agreed that the demonstration is used in the CSL. A Kruskal Wallis test was used to determined differences between students and nurse educator's views on the use of demonstration as a teaching and learning in the CSL. The test was found significant with a p. value of 0.013. The statistical test (Chi-square was performed to determine the relationship between their views of the two groups of students and was found significant (p.value was below 0.005).

Table 2.Demonstration as a teaching and learning strategy in the CSC

Students' program		Disagree	Neutral	Agree	Total
Day	Freq /%	7(4.2%)	35(20.7%)	131(75.2%)	169(100%)
Evening	Freq /%	7(15.6%)	4(8.9%)	34(75.6%)	45(100%)
Total	Freq/%	7(6.6%)	39(18.2%)	163(75.3%)	214(100)

Peer teaching and learning was another method that was used in the CSL. The students from both day and evening program agreed that this strategy is used in the CSL. About 70.4% (n=169) of day program students agreed that the peer teaching is used in the KHI CSL and 88.9% (n=45) agreed that this teaching approach is used in the CSC (see table 3), with about 74.2% (n=159) students from both programmes combined.

Tableau 3 Peer teaching and learning as a strategy of teaching and learning in the CSC

Students' program		Disagree	Neutral	Agree	Total
Day	Freq	12	38	119	169
	%	7.1%	22.5%	70.4%	100%
Evening	Freq	4	1	40	45
	%	8.8%	2.2%	88.9%	100%
Total	Freq	16	39	159	214
	%	7.5%	18.2%	74.2%	100

Data sources showed reflective teaching and learning was one of the teaching methods used in the CSL. The majority of day students n=116, (81.7%) agreed that the reflective teaching and learning was used and found it interesting and helpful. It helped them to self assess their performance and n=45, 84.5% of evening students agreed on the same teaching and learning strategy (see Table 2). The Chi-square test showed relationship between the views of the two groups of students views regarding this strategy (p.value was 0.020). The majority of nurse educators (82%) also agreed that the reflective teaching and learning is used in KHI CSL.

Table 4: Reflective Teaching and Learning Approach

Students' program		Disagree	Neutral	Agree	total
Day	Freq	14	17	116	169
	%	8.3%	10.1%	81.7%	100%
Evening	Freq	5	2	38	45
	%	11.1%	4.4%	84.5%	100%
Total	Freq	19	19	176	214
	%	8.8%	8.9%	82.2%	100%

Majority of staff n=17 (85%) agreed that the small group teaching and learning was used in the CSL and the lab always created opportunity for students to learn in small group.

Figure 3: Small group teaching and learning strategy
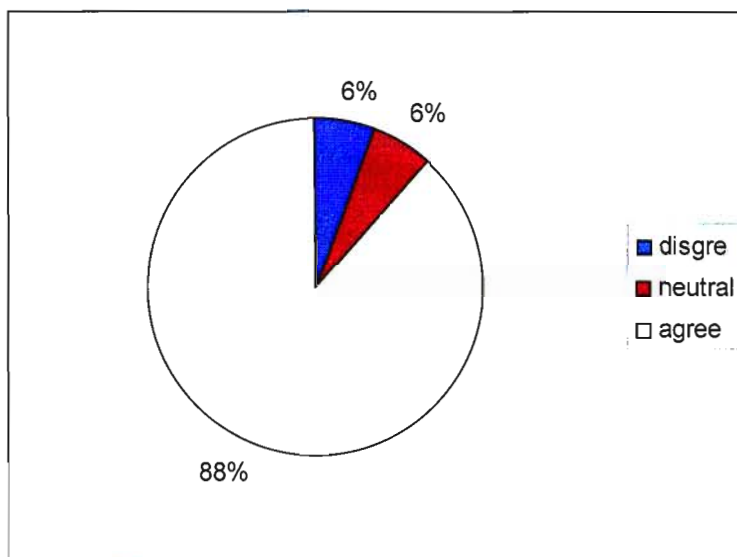
Self directed learning using technology and videos

The researcher noted that SDL was promoted through the use of technology; that is computer assisted learning, DVDs and videos. About 86.4% (n=146) students supported this observation. Annexure 6 with a list of learning packages is evident to this claim. About 86.4% (n=146) of day students agreed that reviewing a video improves their performance and 82.2% (n=37) of staff agreed on that as well. A total of 183 (85.5%) of students from both programmes agreed to the use of videos and that they improved their performance (see Table 5). The

researcher also observed that there were a number of videos and T.V sets in the CSL and that some learning packages had video as supporting learning material. The researcher also observed a number of computers with online learning material and also DVDs for learning purpose.

Table 5: Use of video in the CSL

Students' program	Disagree	Neutral	Agree	Total
Day	8(4.8%)	15(8.9%)	146 (86.4%)	169 (100%)
Evening	6(13.3%)	2(4.4%)	37(82.2%)	45 (100%)
Total	14(6.6%)	17(7.9%)	183(85.5%)	214 (100%)

4.3.3 The teaching and learning process/ Zone of prodromal development

The researcher observed that the teaching and learning process began with the students conducting self assessment to identify gaps in their knowledge. In cases where the nurse educator demonstrated the skills to students, the students were expected to practice until competent and then demonstrate back to the nurse educator assessor) who had to certify that the students are competent.

As illustrated on Table 6, 60.4% of students agreed that tutors systematically extend repertoire of practical skills and 64.7% of staff also agreed on the same statement. Regarding the relationship between the students' responses, the Mann Whitney test gave a p.value of 0.013). The mean for students' scores was 3.58 and the standard deviation was .992. The mean for the staff's score was 3.94 and the standard deviation was .827. The Kruskal Wallis test was performed to

check the relationship between the students and the staff's responses and was found significant (p. value =0.021).

Table 6: Students' Repertoire extended in the CSL

Category	Disagree	Neutral	agree	total
Students	28	56	128	212
Students %	13.2%	26.4%	60.4 %	100%
Staff	0	6	11	17
Staff %	0%	35.3%	64.7%	100%
Total count	19	62	139	100
Total %	12.2%	27.1%	60.7%	100%

Regarding the teaching and learning process, table 7 displays that 47.7% (n=100) of students agreed that they learn a long or complicated procedure or assessment in small parts and 47% of staff n=8 agreed on the same statement. Statistic test were done to see the difference and similarities within the two categories of respondents but the Chi square test was not significant. p. value=0.483. Mann-Whitney Test was performed to see the relationship between a group of students' (A1 and AO) views and was found significant (p.value=0.013

Table 7: Learning a long or complicated procedure/ assessment in small parts

Category	Disagree	Neutral	Agree	total
Students'	32	82	100	214
Students %	14.9%	38.3%	47.7%	100%
Staff	3	6	8	17
Staff %	17.6%	35.3%	47%	100%
Total	35	88	108	231
Total %	15%	38.1%	46.7%	100%

The findings in this study showed that the learning process allows students to practice slowly until they were competent. The majority of the students (n=161, 75.2%) agreed that the CSC allowed them to practice slowly until they become confident and got the skill right (see Table 8). This was in line with the majority of nurse educators' views. About 88.2% (n=15) shared the similar view with the students that the students were given and an opportunity to practice at their own pace until they were confident. The mean for the scores of the staff was 3.96 and the standard deviation was 0.99. The mean for the students' scores was 4.41 the standard deviation was 0.712. The Mann-Whitney test computed between the two groups of students (A1 and AO) was found not significant (.124).

Table 8: Practicing slowly until confidence is gained

Category	Disagree	Neutral	Agree	total
Students'	17(7.9%)	36(16.8%)	161(75.2%)	214(100%)
Staff	0	2 (11.8%)	15 (88.2%)	17(100%)
Total	17 (7.3)	38 (16.4%)	176(76.1%)	231(100%)

The researcher also observed that those who were using self-directed learning packages started by observing videos, practiced on their own, invited their peers to assess them before inviting the person running the CSL to assess them. About 15 (94.1%) of nurse educators agreed that feedback is always given to the students during the teaching learning process.

4.3.3 Perceptions of students and staff about the benefits of using the CSL

The findings in this study showed that using the CSL has a number of benefits, the majority of the students (n=214, 84.6%) agreed that the CSL allowed students to practice in a controlled environment. All nurse educator (n=17), 100% agreed that practicing skills in the CSL were a substantial benefit for the students. Combined (A0 and A1), about 85.6% (n=198) of the students agreed that learning in the CSL was of benefit to the students (see Table 9).

Table 9: Practicing skills as a benefit of teaching and learning in the CSC within student and nurse educator

Category	Disagree	Neutral	Agree	total
Students'	15	18	181	214
Students %	7%	8.4%	84.6%	100%
staff count	0	0	17	17
Staff %	0%	0%	100%	100%
Total count	15	18	198	231
Total %	6.4%	7.8%	85.6%	100%

When breaking down the students' responses, about 84.6% (n=181) agreed that practicing skills was a substantial benefit of coming in the CSC and n=45, 84.5% agreed on the same statement (see Table 10). According to respondents categories (students and staff), n=214, the mean for the students' scores was 4.07 and the standard deviation was 0.893; the mean for the staff's scores was 4.65 and the standard deviation was 0.493. The Chi square statistical test was performed to illustrate the relationship between the two groups of students and was found significant, p. value =0.003.

Table 10: Practicing skills as a benefit of teaching and learning in the CSC within students' program

Students' program		Disagree	Neutral	Agree	Total
Day	Freq /%	10(6%)	16(9.5%)	143(84.6%)	169(100)
Evening	Freq/%	5(11.1%)	2(4.4%)	38(84.5%)	45 (100)
Total	Freq /%	15 (7%)	18(8.4%)	181(84.6%)	214(100)

Finding in this study pointed out that 44.4% of students (n=214) view the CSL as a good place to practice and make mistakes without putting the life of a patient in danger (see Table 11). About 82.3% of staff (nurse educator) agreed also to the same assertion. The statistical test (Chi-square) showed differences between the two categories of respondents (p. value was below 0.005. While comparing the two categories of respondents (students) the mean was 2.77 and the standard deviation was 1.472, and for the staff, the mean was .24, the standard deviation was 1.200. The Kruskal Wallis Test was performed to identify the relationship between students and nurse educator views and was found significance, p. value as it was below 0.005

Table 11: The CSC allows mistakes knowing that no one will be hurt.

Category	Disagree	Neutral	Agree	Total
Students'	84	35	95	214
Students	39.2%	16.4%	44.4%	100.0%
Staff	2	1	14	17
Staff %	11.5%	5.9%	82.3%	100.0%
Total	97	36	98	231
Total %	41.9%	15.6%	42.4%	100.0%

When looking to students views according to students' program, the findings demonstrates that 93.5% (n=158) of day program students agreed that the CSL is valuable as it links theory and practice and 86.7% (n=39) of evening program students also agreed on this assertion (See Table 12). A total of 197 (84.6%) from both groups of students was significant. The chi-square performed to see the relationship within the two groups of students was significant. The p. value was below 0.05.Differences of views of A1 and A0 students were explored using Mann-Whitney test, the p. value was found significant. (P. value = 0.014. Comparing A0 and A1 views on the fact that the CSC links theory and practice, for A1, n=160, mean =4.24 and the standard deviation was 0.830, of n=54, (A0), mean was 3.98 and the standard deviation was 0.835. The Mann Whitney test gave a p vale of 0.014 making the relationship between the scores from both groups significant.

Table 12.The CSL link theory to practice

Students' program		Disagree	Neutral	Agree	Total
Day	Freq	6	5	158	169
	%	3.6%	3.3%	93.5%	100%
Evening	Freq	4	2	39	45
	%	8.9%	4.4%	86.7%	100%
Total	Freq	10	7	197	214
	%	7%	8.4%	84.6%	100

The open ended questions requested nurse educator to express their views on the benefits of the CSL, the limitations and suggestions for effective teaching

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and learning in the CSL. Table 13 summarizes their views on the CSL benefits. About 17 (100%) of nurse educators stated that the CSL provides resources and other materials which help them in teaching and learning. The majority of the nurse educators (n=15; 88.2%) reported that the CSL increases students' motivation for learning as it uses innovative teaching and learning approaches and require them to be responsible for their learning. All (100%) nurse educators stated that the CSL increases students' responsibility for their learning of skills as well as theory. About 88.2% (n=15) of nurse educators indicated that the CSL facilitates students' success on clinical evaluation in clinical on real patients and 58.8% (n=10) stated that the CSL links theory and practice. The majority of nurse educators (88.2%) n=17 said that the CSL ensure peer teaching and self directed learning, almost all nurse educators n=17 confirmed that the CSL location helps them use the CSL at any time. All nurse educator (n=17) stated that the CSL reduce students' and nurse educators' stress while practicing on real patients in the clinical areas.

Table 13: Benefits of the KHI CSC as perceived by nurse educators

Benefits	Frequency	Percent
Provide resources and other materials up date for teaching and learning	17	100%
The location of the CSC (in KHI ,Kigali campus) help students and ourselves use it anytime	15	88.2%
Increase students motivation for learning as it allows mistakes until student become confident	15	88.2%
Increase students' responsibility for their learning	17	100
Help student success on clinical evaluation	15	88.2%
It links theory and practice	10	58.8%
Promote peer learning and self assessment	14	82.3%
Reduce students and nurse educators stress while practicing on real patients in the clinical areas.	17	100%

When asked to express their views about limitations of the teaching and learning in the CSL, nurse educators illustrated some of them. These limitations were summarized in table 14 below. All nurse educators (n=17,100%), confirmed that the CSL is time consuming for them and it is not clear how the teaching and learning in the CSL fits into the curriculum outcomes. According to the nurse educators, it is not easy to support the use of something that it is not clearly mentioned in the curriculum and academic policy. The majority of the nurse educators (n=17, 82.2%) viewed the CSL teaching and learning very costly in staffing and teaching resources. About 24.4% of nurse educators mentioned that the CSL requires clinical and theoretical expertise from the nurse educators to cope with students' demand. All nurse educators pointed out the

communication skills are not addressed in the clinical skills, as there are no live patients.

Table 14: Limitations of KHI CSL teaching and learning

Limitations	Frequency	%
Time consuming for nurse educators	17	100%
-Not clear how it support the outcomes in the curriculum	17	100%
-It is costly in staffing and other teaching and learning resources	15	88.2%
The CSC requires clinical and theoretical expertise for the nurse educator to cope with student demand	5	24.4%
Communication skills are not well addressed in the CSC	10	58.8%

4.3.6 Recommendations to improve the KHI CSL according to the nurse educators

All nurse educators n=17, 100% suggested that the curriculum should clearly indicate how the CSL contributes towards the outcomes expected from their curriculum. How it operates should also be included in KHI academic policy. This could be stipulated in a formal way. The policy should include student's responsibilities and the nurse educator in the process of teaching and learning in the CSL. KHI regulation and policy must be clear on CSL to prevent eventual conflict with students and within staff members. About 14 nurse educators (80%) suggested recruitment of more staff in the CSL which could reduce the workload of staff working in the CSL having other academic responsibilities.

Nurse educators, n=15 (85%) suggested that the CSL be purely students centered so that students can be totally responsible of their learning and not relying on nurse educator demonstrations most of the time. They also suggested the use of simulated patients for students to master communication skills as they are very important in nursing career.

Discussion, Conclusion and Recommendations

5.1. Introduction

This chapter presents a discussion of findings and interpretation of findings in relation to reviewed literature and research conducted in this area. This chapter also presents recommendations and conclusion. To re-iterate this study was aimed at exploring the perceptions of students and nurse educators about teaching and learning in the clinical laboratory in Kigali Health Institute.

5.2. Antecedents of teaching and learning in the CSL

In this study, antecedents of the teaching and learning in the CSC include (a) the location (place of position) of the clinical skills laboratory, (b) the availability of learning resources; that is tutors facilitating learning in the CSL and learning materials, (c) hours of operation of the CSL, (d) scheduling times for using the clinical skills laboratory, (e) making bookings for using the CSL, (f) administration of the CSL

Location of the CSL

The location of the CSL appeared to be critical for the utilization of the laboratory. This was confirmed by students from both programmes; day and evening programme. The students from both programmes agreed (n=159; 77.9%)

that the location of the clinical skills laboratory has an influence on the use of the CSL. From the observation, the researcher also noted that the CSL was situated at 5th floor in the same building as where the classrooms were.

 The nurse educators (n=17, 88.2%) shared the similar view with the students in that the CSL location helped students and themselves use the CSL at anytime. The results in this particular study are in line with the work by Bradley and Postlethwaite, (2003) where they state that CSL environment should be accessible to students and conducive to learning to support the intended outcomes.

Availability of learning resources

The finding revealed that availability of resources was critical for learning in the CSL. The students from both day and evening programmes indicated that they needed to handle real equipment in the CSL and that was important for their learning. The students also indicated that they required mannequins in the CSL as it will help them develop skills. Staff as well as students agreed that mannequins in the CSL are realistic enough to help develop students' skills. Nurse educator indicated that the CSL should provide resources and other materials up date for teaching and learning. Data from observation and document analysis also revealed that KHI CSL had required resources for learning. The setting in the CSL and the resources resemble that in the hospital or clinical settings According to Cowan and Wiens, (1986), Jeffries, (2000) and Jeffries et al., (2002), Hilton and Pollard, (2004), skills laboratories partially reproduce health

care settings, most often 'the hospital ward', and are frequently equipped with artifacts of hospitals, including beds, adult and infant mannequins and a range of medical instruments. Medley and Horne (2005) also stated that many types of simulation equipment used in the CSL can help educators and students by teaching and learning simple clinical skills to a very advanced reality based scenarios from the clinical setting.

Through observations the researcher noted that KHI CSL has two big rooms equipped with computers and mannequins, beds, and other equipments necessary for students learning. It has another room which comprises staff offices, which according to Bradley and Postlethwaite (2003) is important to support teaching staff; meeting room and small space with computers connected to the internet for students to search for information while working in the CSL. A big store room for keeping learning packages for each procedure and consumables was is the fourth room of the KHI CSL. Bradley and Postlethwaite (2003) asserted that a storage space is the frequently overlooked requirement. These authors indicated that although, space dedicated to storage might seem a poor investment with inroads being made into teaching space, this is a mistake. In their view, the expenditure on equipment, models and manikins is likely to see a poor return if these expensive items are not stored appropriately. The expensive equipment if not well stored is placed at risk of damage or misuse and it might even be a threat to the safety of the users of the CSL.

Administration of the CSL

The results revealed that the KHI CSL management is done by the CSL coordinator who performs administrative duties. Her duties include preparing an annual activity plan and budget of the CSL, ensuring the smooth functioning of the CSL, staff development and advocating for the CSL use. Furthermore the findings indicated that the CSL coordinator in collaboration with staff members and other senior nurses in the country develop teaching manuals and DVDs for nursing and midwifery procedures, and also conduct research in this area. The findings additionally revealed that a steering committee of the KHI CSL is on the top management that monitors CSL. Administrative duties which were identified in this study are almost similar to those which were highlighted by Ahmed (2008). Ahmed (2008) stipulated that the duties of a CSL administrative team include scheduling, timetabling, examinations arrangement, maintenance of equipment and financial issues. Additionally, Cahill (2001) pointed out that the main role of the CSL coordinator is advancing clinical initiatives in the school. One of his or her tasks is to produce a policy and procedure manual to ensure safe, appropriate use, maintenance and smooth running of the facilities. Ahmed (2008) argued that a higher committee from concerned departments can be responsible for planning and evaluation of activities of skills centre. According to Hefce (1996), good management and quality control are essential for the effective running of a skills centre. Staff should be available to manage the room and equipment bookings, address enquiries and act as a general liaison point.

It is important to note that the CSL in this particular study was staff with a coordinator who also did most of the teaching, and the administration clerk that also served as a technician. This reflected a challenge regarding staffing of the CSL. Bradley and Postlethwaite (2003) pointed out that well resourced CSL, the staffing include administrative staff (manager, secretary, technicians and simulated patient coordinators) as well as teaching staff, which may include senior academic staff for strategic support, fulltime or part-time clinical skills teacher, sessional clinical teachers such as doctors, nutritionists, as well as specialist, such as cardiologist for procedures such as resuscitation and for teaching about ECG (Bradley & Postlethwaite ,2003).

Access to the CSL:

Access to the CSL emerged as another important factor to be considered for learning in the CSL. The findings revealed that the students have access to the KHI CSL during the day and evening. The laboratory is opened six days per week. The results however showed some form of control regarding access to the CSL in that the users of the CSL had book before hand to be able to use the laboratory. Stark and Fortune's (2003) study also indicated that the students were timetabled to attend sessions in the CSL.

5.3 Teaching and learning in the CSL

The section on teaching and learning has two sub-sections; one with teaching methodologies used in the CSL followed by a subsection which highlights the teaching learning process.

5.3.1 Teaching methodologies used

The findings showed that a variety of teaching and learning strategies are used in the KHI CSL. These include demonstrations (83.3%), teaching and learning in small group (100% of nurse educators), peer learning (70.4% of the students), and self directed learning and reflective learning (81.7% of the students). Although a variety of teaching methodologies were used, the findings revealed that demonstration was the commonly used methodology, a methodology which is associated with teacher-directed learning. This is however contrary to the philosophy of self-directed and experiential learning which underpins the use of the clinical skills laboratories. According to Stark and Fortune (2003) self-directed learning encourages students to seek and maximize learning opportunities. The dominance of demonstration as a teaching strategy in the CSL is not something new. The results from Ahmed's (2008) study also showed that although learning in the CSL is supposed to be self-directed, tutor demonstration was the main method of teaching. Wellard et al. (2007) study which explores the use of CSL is in undergraduate nursing programs in Australia also highlighted the predominance of teacher talk and demonstration in the formally timetabled laboratory classes where teachers demonstrate the specific skills being taught.

Small group learning and peer learning promoted in KHI CSL supports social learning and social constructivism theory, where students learn as a community and learn through constructing knowledge relevant to their context. Bradley and Bligh (2005) emphasized the importance of teaching and learning in small

groups in the CSL in that it is promoted by the social constructivist approach to learning. The results in this particular study mirror those of Amed (2008) which revealed modern educational strategies such as small group teaching and self directed learning to be used in the CSL. This author emphasized that small group size was attributed to helping form close working relationships where teachers are able to gain understanding of individual student learning styles and difficulties, therefore offering more targeted remediation.

The results in this study showed that other forms of innovative teaching were used, including reflective learning, self-directed learning packages accompanied by use of technology in a form of CD Roms and DVDs.These forms of innovative teaching/learning facilitated self-directed learning as well as experiential learning, which according to Rothgeb (2008) facilitate development of critical thinking. Through reflective learning, comprehension and performance is improved (Schon, 1987). Rothgeb indicated that through hand's on experience or learning by doing, the learners develop and improve their level of competence, which was one of the benefits highlighted in this particular study.

The findings in this particular study also showed that the students performed self assessments to identify gaps in their knowledge and target their learning so as to bridge those gaps. This is in line with adult learning theory, as stated on Rothgeb (2008). *Rothgeb asserted that adult learning theory* supports lifelong learning, with learners being generally self-motivated, goal oriented, and relevancy oriented. They learn what they regard as relevant to their learning needs and something they will be able to apply immediately to their practice.

5.3.2 Teaching and learning process in the CSL

Lev Vygotsky in Kneebone, et.al (2004) refers to the space where guided learning takes place, and where intervention by a teacher has the greatest potential to develop the student as a Zone of Proximal Development. The findings in this study revealed that the process of learning begins with self-assessment where students identify gaps in their knowledge and that guides them to relevant learning resources. Either the nurse educator manning the laboratory demonstrates the procedure to the students or the students use self-directed learning packages to learn clinical skills. The students practice on their own until they feel competent to be assessed by the assessor who will declare them competent in that particular competence before going to the real clinical settings to practice on live patients/clients. Findings revealed that students master skills by working slowly until they become confident, with the nurse educator consulted only when needed. According to Vagosky's theory, the teacher provides help when needed but fades into the background when the learner becomes independent. According Kneebone, et al (2004), the deliberate withdrawal of a teacher is a crucial factor in creating the conditions for maturation which is an essential component of safe practice.

The findings in this particular study also revealed that the students learn skills by repetition until they become confident to work with real patient in the clinical area, with the nurse educators systematically extending repertoire of practical skills, giving student's feedback on their performance. When learning long procedures, the findings showed that the long procedure is broken into smaller

parts with assessment of each smaller part done before moving to the next part. The learning process culminates with the student being declared competent in the CSL and ready to practice with real patient/client in real life settings. The teaching and learning process followed in the CSL is in line with the novice-to-expert theory, which describes the pattern of knowledge growth from beginner-novice to the expert level, with the learners developed from a level of the novice to that of the expert (Rothgeb, 2008; Dunphy & Dunphy, 2003). Vygosky looks at this process as a four staged recursive learning process. The first stage is where performance is assisted by more capable others (tutor demonstrating the skills to be learned). During the second stage, the learner carries out a task without assistance from others (demonstrating back to the tutor). According to Dunphy and Dunphy (2003) learners at this stage frequently talk themselves through a procedure, either internally or aloud. During the third stage, performance is developed, automatised and fossilized, as stated in Dunphy and Dunphy (2003). The task become fully internalized and is smooth and automatic. These authors warn that assistance at this stage is not only unnecessary but counter-productive, as it interferes with the internalization process. During the final phase de-automatisation of performance takes place. This according to Dunphy and Dunphy (2003) leads to recursion back through the ZPD.

5.3 Benefits of the CSL

The findings from this study showed that there are a number of benefits associated with the availability and the use of the CSL. These include that the

CSL permits students to practicing clinical skills, allows mistakes knowing that no one will be hurt, facilitates linking of theory to practice, increases students' motivation and confidence, increases students' responsibility for their own learning, facilitates peer learning and self-assessment, and reduces stress related to learning in the real clinical setting.

The majority of students, of both day and evening program agreed that the substantial benefit of the CSL is to allow them practice skills and all nurse educator n=17 (100%) agreed that allowing students practicing skills were the substantial benefit to come in the CSL. Alvera's (2006) study also demonstrate that nursing skills laboratories provide a supportive and caring environment for students where they can practice and have an opportunity to demonstrate nursing skills mastered. According to Bradley and Bligh's (2005) study, the CSL provides a safe space where students learn foundational clinical skills. According to these authors, the CLS provides a springboard from which to achieve the best possible learning from subsequent clinical experience. Wellard, Solvoll and Heggen (2008) also indicated that students learn in the laboratory because it is permissible to make mistakes and confidence be developed through repetitive practice until a skill is mastered. According to Weyrich, et al (2008) CSL facilitates sustainable learning through repetitive practice and immediate feedback to eliminate errors as early as possible.

The findings in this study showed that the CSL ensure a safe practice environment and students were confident to practice knowing no one will be hurt. About 44.4% of students (n=214) agreed that in the CSL they find it good as

they can make mistakes knowing that no one will be hurt. This was support almost by all nurse educators. The CSL according to the findings in this study allow students to make mistakes until they become confident, with the life of the patient/client not at stake. In line with these findings the results from Bradley and Bligh's (2005) study demonstrate that the CSL provides a safe learning environment for students and patients. Ker (2003) also indicated that simulators used in the CSL enable the students to make mistakes without causing discomfort to patient, and they (the students) get confidence without feeling embarrassed. Ahmed (2008) was also of the similar view that the CSL is an environment where mistakes are permissible, the students can feel at ease to learn at their own pace and with frequent rehearsal of particular skills (especially difficult, or painful, or embarrassing ones). According to Good (2003), simulations create opportunities for students to develop essential skills and meet outcomes required for clinical practice in a non threatening environment, without the demands of caring for an actual patient. According to Ziv et al., (2000), simulation in a CSL allows students to achieve a level of competence and safety before attempting a technique or procedure on patient. Furthermore, Freet and Fry (2005) stated that the CSL help to reduce anxiety in students while protecting patients, and that the context was one in which structured learning with feedback could take place.

Findings of this study showed that students of both program agreed that learning in the CSL facilitate linking of theory and practice. In line with these findings Ahmed's (2008) research also revealed that the CSL fills the gap between

theoretical knowledge and clinical practice. Similarly, Clarke (2002) warns that it is important to get a balanced approach to ensure that the integration of theory and practice takes place. This according to Morgan (2005) is critical as nursing education is a combination of theoretical and practical components, which requires integration of theory and practice. Therefore becoming a nurse involves the cognitive, affective and psychomotor domains of learning.

Morgan's (2005) results also reflected that the clinical skills laboratories promote theory–practice integration. This author further stressed that theory taught in the classroom by educators provides nursing students with a knowledge base, which can be reinforced during clinical skills sessions in a safe environment such as clinical skills laboratories.

5. 4 Limitations of the CSL

The results of this study showed that limitation of teaching and learning in the CSL were that it is time consuming, costly in terms of staffing and resources and the curriculum does not clearly articulate how the CSL fits into the curriculum. In addition, the findings displayed that the CSL requires clinical and theoretical expertise for the nurse educator to cope with student demand. The findings showed the gap in the teaching of communication skills in the CSL.

Regarding the issue of staffing, Bradley and Postleworth (2006) suggested that teaching staff may be drawn from a variety of backgrounds. Furthermore, appropriate staff development will be required to ensure consistency and quality of teaching with monitoring and evaluation to assure appropriate

standards. Stark and Fortune (2003) warn that CSLs have been successfully developed in European countries but it is not always appropriate to transfer this model as is to health care school in developing countries because the capital cost of setting up a CSL by far exceeds local budgets and once set up and equipped, the maintenance and running costs my prove prohibitive in the long term.

Just like the findings in this particular study, Ahmed (2008) stressed that although the CSL is valuable for its benefits, it is difficult to set it because it is time consuming and costly. Childs (2002)'s study revealed mismatches between curriculum and resources, and issues associated with available and appropriate staff, space, equipment and technology. This mean proper planning is critical for effective learning in the CSL. Comer (2005) also highlighted that CSL teaching has benefited many educational programs, but the price of its equipments and materials, plus maintenance and upgrades, exceeds the resources of many nursing programs.

5.5. Conclusion

The findings in this study highlighted a number of important antecedents for effective learning in the clinical skills laboratory. These included the well positioned CSL that is easily accessible to the users; the availability of learning resources which were regarded as critical as students learning through doing and experience; human resources, that is nurse educators to man the CSL,

clinical skills coordinator and a technician; hours of operation of the CSL that take into consideration the available of students; controlled access to the CSL through scheduling times for using the clinical skills laboratory and making users pre-book space in the CSL; and availability of a CSL coordinator to undertake administrative duties of the CSL.

Regarding teaching and learning, the findings revealed that a variety of teaching methods are used both traditional (demonstrations) and innovative methods (small group teaching, peer learning, reflective learning, self-directed learning promoted through using learning packages and technology in a form of videos, CDs and DVDs). The dominant use of demonstrations was however frown upon as CSLs are supposed to promote mainly self-directed learning with minimum use of demonstrations depending on the need The findings showed that teaching learning process facilitated development from a novice to an expert at the level of the CSL before being allowed to practice on a real patient or client.

The results showed a number of benefits and limitations of using CSLs. The benefits included that the CSL provided a space which permits students to practicing clinical skills without fear to harm the patients or clients, a space which allows them to make mistakes and learn from those mistakes, a space where immediate feedback is provided to facilitate learning, a space that, facilitates linking of theory to practice, a space where students' motivation and confidence is increased and responsibility for own learning is promoted. The CSL facilitates peer learning and self-assessment, and reduce stress related to

learning in the real clinical setting. The limitations of the KHI CSL included that the curriculum did not clear indicate how the CSL contributes towards the set programme outcomes and there was no policy regarding how it operates. Other limitations included staffing and cost related to running the CSL, inadequate resources to teach communication skills.

6. Recommendations

The recommendations are divided into administration of the CSL, staff development and future research.

6.1. KHI administration

Staffing of the CSL was one of the concerns in this study. The KHI administration has to recruit more staff for the nursing department and for the CSL in particular. The staff from the clinical settings may be used as part-time staff or be invited as experts to teach some skills. Other disciplines may be used to teach skills relevant to their areas of practice, for example the doctor to teach ECG (not because nurses cannot teach this but as a way of augmenting staff).

A thorough and informed needs assessment has to be conducted to ensure that supportive initiatives address critical problems or areas of concern. For example, the findings in this study revealed a gap in teaching communication skills because there is no provision for this. It is advisable that this is attended to, even if it means using simulated patients to teach this particular skill. The recruitment and training of simulated patients is suggested.

The CSL coordinator has a responsibility of ensuring that in the next review of the curriculum, the issue of how learning in the CSL contributes towards the programme outcomes is addressed. A programme structure or map of clinical learning experiences should indicate where learning in the CSL fit and the number of hours to be covered in the CSL at each level in the programme and the total number of hours to be covered in the CSL on completion of the programme. The curriculum should also address the issue of promoting mainly self-directed learning in the clinical skills and limiting tutor demonstration. Furthermore, there must be formal rules and regulations in the academic policy manual to accommodate the concerns regarding the use of the CSL. This should serve as a guide for the well utilization of the CSL by all users including the students and nurse educators.

6.2. Future research

Future research should focus on the outcomes of learning in the clinical skills laboratory in relation to what the CSL is set to achieve; the cost of setting up and maintaining a clinical skills laboratory as there are claims that it is a costly exercise in relation to both human and material resources, especially in developing countries; and explore how integration of theory to practice is facilitated in the CSL as there are claims refuting this statement.

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Annexure 1: Student Questionnaire

Study Title: Perceptions of Students and Nurses Educators about Teaching and learning in the Clinical Skills laboratory in Kigali Institute/Rwanda: A exploratory-Descriptive study.

Questionnaire No: ☐

Part 1: Demographic Data

1. Group (Please **Tick (√)** the correct response): A1 ☐   A0 ☐

2. Day programme: ☐   **Evening programme** ☐

3. Please write your Age: ___ _____

4. Gender: Male ☐   Female ☐

Part 2: Information on perceptions of students on teaching and learning in the CSL

Please rank the utilization of the clinical skills laboratory by ticking the responses of your choice
1= strongly disagree, 2=disagree, 3=neutral, 4=agree, 5= strongly agree

Item	SD 1	D 2	N 3	A 4	SA 5
4.1. A substantial benefit of coming here is to practice practical skills					
4.2. Practicing in the CSC allows me to refer teaching and learning to instructions as I go along					
4.3. In the Skills Centre I can practice skills slowly until I become proficient enough to do them at normal speed.					
4.4. We learn a long or complicated procedure/assessment in small parts					
4.5. Can get adequate help when I am struggling with something.					
4.6. The tutors systematically extend our repertoire (number, range, variety) of practical skills.					
4.7. Time spent in the CSC results in a progressive improvement in my clinical skills					
4.8. I do not see any connection between the different things I have					

learnt in the CSC					
4.9. I am taught theory and practice in the CSC but I find it hard to integrate them					
4.10. In clinical areas I often make use of skills learnt in the Skills Centre					
4.11. Things I do in the CSC require me to use some of the theory I have been taught					
4.12. Things I do in the CSC help me to develop general patient management skills.					
4.13. Things I do in the Skills Centre help to link theory and practice.					
4.14. Each session, I practice practical skills.					
4.15. I use timetabled sessions in the Skills Centre to improve my performance in things that have caused me problems in clinical areas					
4.16 .I book time in the Skills Centre to improve my performance in things that have caused me problems in clinical areas					
4.17. It is good to be able to make mistakes and know that no one will get hurt					
4.18. Practice in the Skills Centre makes my conduct on clinical placements/rotations safer for myself and colleagues					
4.19. Practice in the Skills Centre makes my conduct on clinical placements/rotations safer for patients/my self and my colleagues.					
4.20. Practice in the Skills Centre improves my performance in clinical areas.					
4.21. Things I do in the CSC help me to behave ethically in clinical areas.					
4.22. In the Skills Centre I remember things that happened in clinical areas, and learn what I could do better next time					
4.23. Things I do in the Skills Centre help me to make sense of some of the theory I have been taught.					
4.24. Things I do in the CSC help me to make sense of clinical experience					
4.25. In the Skills Centre I find it really helps my learning to try to self-assess my own performance .					
4.26. In the Skills Centre I find suggestions from my peers about how I can improve what I do, really helpful .					
4.27 Things done here could equally well be done elsewhere.					
4.28. Things done here would be better done in a clinical area					
4.29. Things done in my Skills Centre sessions would be better done in the clinical setting					
4.30. A substantial benefit of coming here is to get some peace and quiet					
4.31. A substantial benefit of coming here is to practice without patients					
4.32. Practice in the Skills Centre is too artificial to be useful					

4.33. Practicing in the Skills Centre makes me more sensitive, empathetic when I do the same thing with a patient.					
4.34. Practicing in the Skills Centre makes me more skillful when I do the same thing with a patient.					
4.35. Attaining proficiency in a skill in the Skills Centre does not imply that a student will be proficient in a clinical setting 4.36. Even when I get good at a skill in the CSC I need practice with real patient.					
4.37. Handling real equipment in a simulated setting is helpful					
4.38.The mannequins are realistic enough to help develop my skills					
4.39. I perform better in the Skills Centre than I do with real patients					
4.40. I perform better with real patients than in the Skills Centre.					
4.41. Reviewing video tapes of my performance helps me to improve					
4.42. When I practice a skill I review my performance and try it again if necessary					
4.43. I come here because the sessions are timetabled here					
4.44. I come here for tutors to teach me clinical skills					
4.45. I come here for tutors to teach me theory					
4.46.Unless it is for a time-tabled session, I only come here to revise for the OSCE					
4.47. I come here to revise for the OSCE					
4.48. I come here to prepare for work in clinical areas					
4.49. I come here to improve my clinical skills					
4.50. KHI is a convenient location for the CSL					

Annexure 1: Staff questionnaire

Study Title: Perceptions of Students and Nurses Educators about Teaching and learning in the Clinical Skills laboratory in Kigali Institute/Rwanda: An exploratory-Descriptive study.

Questionnaire No:

Part 1: Demographic data
(Please **Tick (√)** the correct response)

Nurse Educator ☐   Clinical Instructor ☐

1. Please write down your age   ....

2. Working Experience in the nursing and midwifery department ------------- (months or years of experience) ☐

3. Gender

Male ☐   Female ☐

4. What is your role in the department?

Lecturer (educator) ☐   Clinical instructor ☐

5. In which **Programme do you teach?** AO ☐   A1 ☐   Both ☐

Part 2: Information on the teaching and learning in the CSL

6. Please rank your perceptions on the learning process in the clinical skills laboratory by ticking the responses of your choice

1= strongly disagree, 2=disagree, 3=neutral, 4=agree, 5= strongly agree

Staff's items	SD 1	D 2	N 3	A 4	SA 5
6.1. A major objective of my teaching in the Skills Centre is to allow students as much time to practice as possible					
6.2. In the CSC students can redo practical things until they are confident.					
6.3. In the CSC students can redo practical things until they are confident					
6.4. Students learn a long or complicated procedure/assessment					
6.5. When students are struggling, I generally help them					
6.6. I systematically extend students' repertoire.					
6.7. I teach theory and practice in the CSC but I find it hard to integrate them.					
6.8. I systematically extend students' repertoire					

6.9. My Skills Centre sessions help students to develop general patient management .					
6.10. Each session, I practice practical skills /my session in CSc allows students practice practical skills					
6.11. It is good to be able to let students make mistakes, knowing that no one will be hurt.					
6.12. Practice in the Skills Centre improves students' performance in psychomotor skills improve students performance					
6.13. My Skills Centre sessions help students to make sense of responsibility . improve students performance					
6.14. In CSC sessions I encourage students to try to self-assess their. .					
6.15. Things done in my Skills Centre sessions would be better done in elsewhere					
6.16. In CSC sessions I encourage students to try to self-assess their competences					
6.17. In Skills Centre sessions students help each other to improve their skills					
618. Things done here would be better done in a clinical area					
6.19.Things done here could be done equally well in an ordinary classroom					
6.20. A substantial benefit of coming here is to get some peace and quiet					
6.21. A substantial benefit of coming here is to practice without patients					
6.22. Practice in the Skills Centre is too artificial to be useful for students.					
6.23. Practicing in the Skills Centre makes students more confident when they work on patient					
6.24. Practicing in the Skills Centre makes students more skilful when they work on patient.					
6.25. The mannequins are realistic enough to help develop students' skills. Antecedents					
6.26. Students perform better in the Skills Centre than with real patients					
6.27. Practicing in the CSC makes students more sensitive/empathetic.					
6.28. Practicing proficiency in a skill in the Skills Centre does not imply that a student will be proficient in a clinical setting .					
6.29. Students perform better with real patients than in the Skills Centre					
6.30. When students practice a skill in the CSC they review their theory.					
6.31.I nearly always demonstrate a skill before asking students to try it					
6.32.A substantial benefit of the Centre is enabling small group					

tuition					
6.33. I enjoy teaching in the Skills Centre.					
6.34. Assessment in the Skills Centre is a reasonable measure of students' competencies					
6.35. My sessions in the CSC always include demonstrating clinical to students					
6.36. I always give ground rules for a safe learning environment					
6.37.Within each session I give students feedback on their performance					
6.38. A major objective of my teaching in the Skills Centre is to ensure students see a skill ,performed to a high standard at least once					
6.39. A major objective of my teaching in the Skills Centre is to ensure students have an opportunity to reflect upon their experience to date					
6.40.When teaching in the Skills Centre, I try to create opportunities for students to learn from each other in small groups					
6.41. My SCS sessions focus on skills most commonly required of students in the clinical areas					
6.42. My Skills Centre sessions focus on skills that we may not be able to provide students with sufficient opportunities to practice in clinical areas					
6.43. My Skills Centre sessions focus on skills that are better taught away from clinical areas					
6.44. Teaching in the Skills Centre has increased my understanding of how students learn clinical/communication					
6.45. Teaching in the Skills Centre has changed my approach to teach practical skills					

Please be kind to answer theses 3 questions on teaching in the CSL
7. what are benefits of the teaching/learning in the CSL

……
……
……
…………………………

8. What are the limitations of teaching and learning in at he CSL

……
……

9. Any recommendation to improve the teaching and learning in the CSL

……
………………………………………………………………………………………………………

Annexure 2: Sets and skills most used in the KHI CSC

- Family Planning
- Dressing
- Enema
- Sample taking
- Vital signs
- Mannequin d'Auscultation pulmonaire et cardiaque
- Material for episiotomy
- Matériel pour le N. Né
- Mannequin de IUD
- Material for infusion
- Medication
- Dressing a patient with tracheotomy
- Suturing
- Gastric worshing
- Naso-Gastric intubation
- Catheterisation
- Material for ante natal consultation
- Mannequin for pregnant Women
- Set for derivaring and mannequin for that purpose
- Gynechology set and it mannequin
- Mannequin for resciscitation
- Mannequin for bandages

Annexure 3: Material and equipment used in the CSC

- ❖ Koken baby girl for nurse training model
- ❖ Koken baby boy for nurse training model
- ❖ Urethral catheterization model female (with storage bag)
- ❖ Female catheterization and rectal injection model type 2 (elastics)
- ❖ Neonatal intubation training model
- ❖ Female organ model type 1 (insertion IUD)
- ❖ Male catheter model
- ❖ Inspection and palpation of breast cancer training model type1
- ❖ ACF Pad-venipuncture for adults
- ❖ Epidermis for ACF Pad for adults (replacements)
- ❖ Vein for ACF Pad for adults (replacements)
- ❖ Mock Blood
- ❖ Episiotomy Trainer
- ❖ Episiotomy Pad (for replacement)
- ❖ Gynaecology training model
- ❖ Negroid Injection Arm Trainer
- ❖ Negorid Skin Vein & Blood Kit, Post 98 (for replacement)
- ❖ Blood Concentrate 50g Pot (300)
- ❖ Obstetric Phantom-Standard
- ❖ Bar with Pinna with anatomic model

- ❖ Brain 15 parts anatomic model
- ❖ Eyeball with Part Orbit (8) anatomic model
- ❖ Bedford Doll Female
- ❖ Bedford Doll Female Black
- ❖ Set 2 Stump Bandaging Sims
- ❖ Ear Diagnostic Trainer
- ❖ Ear Syringing Trainer
- ❖ Adam CPR Adult Torso & Case
- ❖ Kevin 6-9 month old infant CPR Manikin with Carrying Bag
- ❖ Multiple Casualty Simulation
- ❖ Teaching Stethoscope
- ❖ Auscultation Trainer and Smartscope
- ❖ Three Vein Pad-Venipuncture (pediatric use)
- ❖ Epidermis for Three Vein Pad (pediatric use), replacement
- ❖ Vein for Three Vein Pad (pediatric use), replacement
- ❖ Knot Tying Trainer
- ❖ Articulated plastic skeleton
- ❖ Child Airway Management Trainer
- ❖ Airway Management Trainer
- ❖ Airway Larry AMT Head with stand
- ❖ Feces removal and glycerine enema training model
- ❖ IPAS Model for AMIU
- ❖ Pediatric injectable head simulator
- ❖ Tracheostomy Care Simulator
- ❖ Spinal Injection Simulator
- ❖ Teaching Stethoscope
- ❖ Laryngoscope Set
- ❖ Baby Buddy infant CPR manikin
- ❖ Baby Buddy lung bags(100 bags)
- ❖ Three Vein Pad-Venipuncture (pediatric use)
- ❖ Knot tying trainer (locally made)
- ❖ Dilatation planks (locally made)
- ❖ Demonstration penis (locally made)

- ❖ birth chair (locally made)
- ❖ Syringue pump (Fresenius Pilot A2)
- ❖ monitoring AS/3 Datex-ohmeda
- ❖ Lactina Electric plus tire-lait
- ❖ Set de tire-lait double
- ❖ Set de tire-lait simple (lactaset)
- ❖ set de nutrition supplementaire
- ❖ flipchart breast self-examination
- ❖ flipchart: testicle self-examination
- ❖ chart: female reproductive system
- ❖ chart: male reproductive system
- ❖ chart: Understanding ulcers
- ❖ chart: spinal nerves
- ❖ chart autonomic nervous system
- ❖ chart lymphatic system
- ❖ chart muscular system
- ❖ chart nervous system
- ❖ chart the eye
- ❖ chart infertility
- ❖ chart conditions for caesarean section
- ❖ chart understanding diabetes
- ❖ chart understanding cancer
- ❖ chart understanding breastcancer
- ❖ chart understanding HIV/AIDS
- ❖ chart the respiratory system and asthma
- ❖ chart understanding allergies
- ❖ chart hypertention
- ❖ chart the prostate
- ❖ chart diseases of the digestive system
- ❖ chart disorders of the teeth and jaw
- ❖ chart pregnancy and birth
- ❖ chart understanding menopause
- ❖ chart understanding skin cancer

- ❖ chart development of blood cells
- ❖ set of six charts, pregnancy and birth
- ❖ male premature baby
- ❖ infant model for nursing practice
- ❖ Obstetric phantom-Set
- ❖ Manikin reanimation neonate (ambu-baby)

Annexure 4: Material and equipment allocation in the KHI CSC store

LOCALISATION DES MATERIEL EN STOCK					
1A	**1B**	**2A**	**2B**	**3A**	**3B**
Set for training Aids attitude	Set for family Planning	Set for resuscitation	Otoscope, Laryngoscopes	Catheters(Rectal , Vesical, Nasogastric)	Urinal catheters
4A	**4B**	**5A**	**5B**	**6A**	**6B**
Forceps and scissors	Reserve forceps and Scissors	Reserve kidney dishes	kidney dishes	Disinfectants,	Reservations des towels
Materiel for plaster	Materiel for plaster	Bed pan and urinals	Bed pan and urinals	Liquid and others	
7A	**7B**	**8A**	**8B**	**9A**	**9B**
Reserve of colostomy	Set of emergency	Reserve of scales	scales	Material for AID prevention	Reserve equipment
10A	**10B**	**11A**	**11B**	**12A**	**12B**
Theatre technique	Resources for theatre technique	Set of dressing 2	Set for dressing 2 Abscess incision and draining	Set for sample taking	Set for enema
13A	**13B**	**14A**	**14B**	**15A**	**15B**
Set for plaster I	Set of vital signs I	Set for bandages	Set of hygiene	Reserve of Gause, sterile towels	Reserve of none sterile gauzes and towels.
Set for plaster I	Set of vital signs II	Set of respiratory care			
16A	**16B**	**17A**	**17B**	**18A**	**18B**
Reserve of drums and Gauzes	Set of blood transfusion	Mannequin of respiratory examination	Mannequin of women examination	Mannequin Of resuscitation	Mannequin Larynx examination Baby resuscitation
19A	**19B**	**20A**	**20B**	**21A**	**21B**

Material for episiotomy Mannequin for IUD	Reserve for midwifery procedure	Material for new born	Reserve for new born care .	Reserve for infusion	Reserve for infusion de Perfusion
22A	**22B**	**23A**	**23B**	**24A**	**24B**
Dressing tracheotomy wound	Set of medication I Medicaments I	St of suturing I	Perfusion I	Gastric wash Nasogastric intubation	Male catheterization
25A	**25B**	**26A**	**26B**	**27A**	**27B**
Reserve of sutures **28A**	Reserve of sutures **28B**	Réserve of sutures **29A**	Suturing reserve materials) **29B**	Set of ante natal care. **30A**	Set of delivery **30B**
Set of gynecology.material for cervix suturing	Empty boxes	Empty boxes	Spares of new born mannequin	Mannequin for new	Material for child care
31A	**31B**	**32A**	**32B**	**33A**	**33B**
Reserve material for midwives	Reserve material for midwives	Reserve material for midwives	Mannequin for Bandage	Reserve for theatre material and POP procedure	Reserve for theatre material and POP procedure
34A	**34B**	**35A**	**35B**	**36A**	**36B**
Material for plaster	cotton, Sprit ,swab	Empty boxes	Reservations du Materiel	Material for suction	Suction machine
37A	**37B**	**38A**	**38B**	**39A**	**39B**
Empty boxes.	Empty boxes	Reservation des Syringes-	Reserve of syringes	Reserve of gloves different size	Reserve of sterile gloves and different size
40A	**40B**	**41A**	**41B**	**42A**	**42B**
Reserve sterile gloves.	None sterile gloves	Reserve of cotton and plaster material	Reserve of cotton and plaster material	Reserve needles	Needles
43A		**44A**	**44B**	**49A**	**49B**
Reserve of gloves Gants	Reserve of gloves Gants	Reserve of gloves Gants	Reserve of Flipchart	Syringes	Syringes

CD-ROMS

Item	Description	Qty
1	ADAM Interactive Anatomy (w/3D Library v I & II), WIN CD,Network-Single seat 11 users	1
2	Interactive Physiology, 7 system Suite, Hybrid CD, Network 11- Single seat	1
3	Clinical simulations in medical-surgical ursing III CD/ROM (WIN/networkable)	1
4	AACN Clinical simulations: Pulmonary system CD-ROM (version 4,0) WIN	1
5	Suture Tutor Trainee Kit	1
6	Local Anaesthesia for minor Surgery Trainee Kit	1
7	Minor Skin Procedures Trainee Kit	1
8	Ingrowing Toenail Trainee Kit	1
9	Parasitology	1
10	Basic emergency care	1
11	Skills in Neonatology	1
13	General Procedural Skills	1
14	Interpretation of Adult Chest X-rays	1
15	Active management of the third stage of labor: a demonstration (for preventing postpartum hemorrhage: toolkit for providers)	1
16	Performing Uterine evacuation with the IPAS Plus aspirator (instructional CD-ROM)	1
17	Reproductive health library 2006	1
18	Kit for ressources for malaria within the pregnancy.	1
19	Manual handling	1
20	Skills first year	1
21	Obstetric emergency care	1
22	VIP latrine	1
23	A premie needs his mother	1
24	Breastfeeding: mom and I can do that!	1
25	Breastfeeding: baby-let breastfeeding…The mother-Baby dance	1

Video cassettes

Item	Description	Qty
1	Heads and tales " SAFAIDS"	1
2	We Miss You All " Noerine Kaleeba: AIDS in the family"	1
3	The bridge of life	1
4	Examining the Gynaecological Patient " A structured guide "	1
5	E m b r y o l o g i e	1
6	V C T	1
7	HIV and seropositivity in an busness center	1
8	There was I.......	1
9	There was II.......	1
10	There was III.......	1
11	There was	1
12	The baby is a person	1
13	The mystery of human body	1
14	Breastfeeding dealing with the problems	1
15	Becoming baby friendly	1
16	A guide to newborn examination	1
17	Breastfeeding, the first week	1
18	Birth	1
19	Baby massage	1
21	Delivering in water.	1

Annexure 5: Use of the CSC

This is a timetable elaborated by the Coordinator of the CSC in a weekly meeting. This is done trough the process of negotiation as nurse educators have other responsibilities and some of them have facilitation in other KHI campuses. All students access the CSC by booking individually or as a group. There is no specification according to students' group or level.

Time table for staff

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.00-12.00	Nurse educator 1	Nurse ed.1	Nurse educator 4	Nurse educator 5	Nurse educator 2	Nurse ed.1
12.00-14.00	L	U	N	C	H	
14.00-17.00	Nurse educator 2	Nurse educator 1	sport	Nurse educator 5	Nurse educator 1	Nurse ed.1
17.00-21.00	Nurse educator 3	Nurse educator 2	sport	Nurse ed.3	Nurse educator 1	closed

Annexure 6: Rules and guidelines for the use of the CSC

1. Booking of materials

NB. All booking are done manually

- All staff members of the nursing department should access resources trough booking. All booking must be done one day before the used of desired material and equipment.
- The staff members must first verify learning resources before use and sign for them on reception
- After use, the resources must be returned in good condition as it was after a double check with a CSC staff.

2. Staff and students' booking in the CSC

- The Booking must be done one day before the utilization.
- After the use of the CSC, it must be arranged as it was.
- The booking must specify procedure and the time to perform it, the number of students in that session.
- Material must be double checked before and after use. If some thing is missing, the student or the staff is responsible to pay for it back.
- If the booking is done by a group, there must be a group leader who will be accountable for the material.
- Any inquiry is addressed to the facilitator allocated in the CSC.
- Each student must sign the attendance and specify what have been done whether practicing skills or competence evaluation .The student must be sure what he/she have done is recorded for her/his file .
- If it is a facilitator demonstrating, the facilitator writes skills done and the number of students present and equipment and material used.

3. Rules concerning Clinical examination (OSCE)

- Student briefing should be done a day before the exam and at the beginning of the exam.
- Stations should be prepared the day before the examination. From the day before the examination, no student is allowed to book for session due to do preparations.
- Students and staff must be in uniform
- The students who fail OSCE are not allowed to clinical placements before repeating and being able to score 60%
- Marks of OSCE are part of the continuous assessment of the course to be evaluated.
- All students must do their exam the same day. No communication with students who have done their exam with those who are still waiting for their exam.
- All cell phones are not allowed during the exam.

Annexure 9.Research Ethical clearance approval

UNIVERSITY OF
KWAZULU-NATAL

RESEARCH OFFICE (GOVAN MBEKI CENTRE)
WESTVILLE CAMPUS
TELEPHONE NO.: 031 – 2603587
EMAIL : ximbap@ukzn.ac.za

22 SEPTEMBER 2008

MRS. C UWIMANA (203502928)
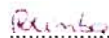SCHOOL OF NURSING

Dear Mrs. Uwimana

ETHICAL CLEARANCE APPROVAL NUMBER: HSS/0450/08M

I wish to confirm that ethical clearance has been approved for the following project:

*"Perceptions of Students and Nurse Educators about Teaching and Leaning in the Clinical Skills
Laboratory in Kigali Health Institute/Rwanda: An Exploratory-Descriptive Study"*

PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years

Yours faithfully

MS. PHUMELELE XIMBA

cc. Supervisor (Prof. NG Mtshali)
cc. Mr. S Reddy

Annex 10. KHI approval to conduct the Research

KIGALI HEALTH INSTITUTE

B.P. 3286 Kigali, RWANDA
Tel: + (250) 572172; +250 571788
e-mail: deanchd@khi.ac.rw

Research Ethics and Consultancy Committee

7th July 2008

Mrs UWIMANA Catherine
Masters Student
University of Kwazulu Natal
School of Nursing
P.O Box 4041, Durban-South Africa
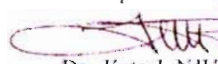E-mail: uwacathy@yahoo.fr

Dear Mrs UWIMANA

Re: Review of your research proposal

Herewith attached please find the comments made after reviewing your proposal entitled
" **Perceptions of students and nurse educators about teaching/learning in the clinical skill laboratory at Kigali Health institute/Rwanda.**

As these observations are pertinent, you are strongly advised to take them into consideration.

Nevertheless, I do here inform you that your proposal has been approved for implementation on the understanding that you shall put the comments and suggestions given to you into account.

Also, you shall be required to present a summary of your results to Kigali Health Insitute for implementation purposes.

Dr. Kato J. NJUNWA

Kigali Health Institute
K.H.I
Faculty of Community Health Development

Chairman, Research, Ethics and Consultancy Committee

Cc:
- Rector
- VRAR
- Registrar

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