

DEVELOPMENT OF AN INSTRUMENT TO MEASURE THE CLINICAL LEARNING ENVIRONMENT IN HEALTH SCIENCES

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30 NOVEMBER 2020

DECLARATION

“I, Hanlie Jordaan, declare that the Master’s Degree research dissertation that I herewith submit for the Master’s Degree qualification M.Soc.Sc in Nursing at the University of the Free State is my independent work, and that I have not previously submitted it for a qualification at another institution of higher education.”

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November 2020

Date

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"...I put my trust in the grace of God forever and ever. I will praise you forever for what you have done."

Psalms 52:10-11

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ABSTRACT

A positive and stimulating clinical learning environment (CLE) is key to health professional students' as it increases their opportunities to transfer learning and become competent professionals. The evaluation of the CLE is crucial to determine the quality of the students' clinical experience and learning opportunities, as well as to promote a supportive CLE for students. The CLE has received ample attention from researchers over the past three decades. From the literature, four major aspects are identified to contribute to a positive CLE, including the atmosphere of the clinical settings; teamwork; staff and student workloads; and learning opportunities offered by clinical settings to students to practice people-centred care. An instrument that is used to measure the CLE is expected to address these aspects to promote a positive CLE.

An overview of existing CLE measuring instruments, however, revealed that the instruments failed to address all four of these major aspects. Failing to address those aspects in the measuring instrument may lead to the failure to identify weaknesses in current systems, or to measure new CLEs in terms of its potential contribution to work-integrated learning (WIL). Ultimately it may have a negative impact on the clinical learning of students. Therefore, a more comprehensive, valid and reliable instrument is needed to measure the complex characteristics of CLEs, and to determine whether they provide the essential learning opportunities for professional students. Therefore this research aimed to develop an instrument that measures the clinical learning environments of students in health sciences, addressing all major aspects associated with a positive CLE.

This study was conducted in two phases. The first phase included the development of an instrument that measures the CLE based on pre-existing instruments and literature. Nineteen instruments, consisting of 454 items, were identified. The items were thematically analysed and refined to develop the first version of the instrument. The first version instrument consisted of 66 items.

The second phase included a Delphi study to determine the face and content validity of the first version instrument. A consensus Delphi technique, with an agreement rate of 70% was used to validate the inclusion of items for the final instrument. An expert panel of qualified healthcare professionals proved to be most suitable to obtain the face and content validity of the items. The panel members included diverse expert healthcare professionals from various African countries and healthcare facilities. Of the 54 experts initially invited, 36 indicated an interest to participate. During the first round, 22 panel members responded to the instrument while 16 panel members responded during round two. Ten panel members took part in the third and final round. A possibility for professional attrition may be that all healthcare practitioners were called to the frontline during the CoVID-19 pandemic.

Based on the results of the Delphi-study, four of the original 66 items were eliminated due to a lack of consensus. The remaining 62 items were judged to have face and content validity and were included in the final instrument. The 62 items in the second version of the instrument address all major aspects that contribute to a positive CLE.

The instrument developed in this research can benefit a range of role-players involved in the WIL of students in the healthcare profession. It could be used as an evaluation instrument for new CLEs, and to measure its potential contribution to WIL; it could assist in identifying inherent weak areas in the system that need strengthening; professional governing bodies could use it to accredit clinical settings for placements of health professional students.

It is recommended that the construct validity and reliability of the instrument be tested in future research.

Key terms: Clinical learning environment, develop, health science, health professions students, instrument, validity.

ACRONYMS

CCLE:	Collaboration of Clinical Learning Environment
CLE	Clinical learning environment
CLEI	Clinical Learning Environment Inventory
CLES	Clinical Learning Environment and Supervision
CLES-T	Clinical Learning Environment, Supervision and Teacher
CPET	Clinical Placement Evaluation Tool
DECLEI	Dental Clinical Learning Environment Instrument
DoH	Department of Health
D-Rect	Dutch Residency Educational Climate Test
DREEM	Dundee Ready Education Environment Measure
ECI	Educational Climate Inventory
HPCSA	Health Professions Council of South Africa
HSEI	Health Science education institution
HSREC	Health Science Research Ethics Committee
HSO	Health Standards Organisation
ICPLEI	Inter-Professional Clinical Placement Learning Environment Inventory
IHME	Institute for Health Metrics and Evaluation, Human Development Network
LTSI	Learning Transfer System Inventory
N2N	Nurse to Nurse instrument
NES	Nursing Education Stakeholders
PhD	Philosophia Doctor
PHEEM	Postgraduate Hospital Educational Environment Measure
PICOT	Population, Intervention, Comparison of interest, Outcome and Time
SANC	South African Nursing Council
SAPC	South African Pharmacy Council
SECEE	Student Evaluation of Clinical Education Environment scale
UFS	University of the Free State
UHC	Universal health coverage / United healthcare
WHO	World Health Organisation
WIL	Work-integrated Learning

CONCEPT CLARIFICATION

Concepts of this study are listed alphabetically.

Clinical learning environment is an environment where students have the opportunity to integrate theory and practice to create meaningful learning experiences and provide safe patient care while being supported by relevant role players within the clinical setting (Muthathi, Thurling & Armstrong, 2017:1; Jansson & Ene, 2016:17; D'Souza, Karkada, Parahoo & Venkatesaperumal, 2015:833). The clinical learning environment (CLE) includes the physical space, nature of interaction between people in the clinical setting, the facilitation effectiveness, student engagement in care, and the organisational culture that impact on the student's ability to reach learning outcomes in the clinical setting (Mansutti, Saiani, Grassetti & Palese, 2017:61; Abed, Mansur & Saleh, 2015:470). The elements of the CLE will be captured by the items in the developed draft instrument.

Develop is the process of creating or producing something to make it more suitable for use (Merriam-Webster's Medical Dictionary, 2019: online). A new instrument will be developed by locating existing instruments; a thematic analysis of items compiled from existing instruments, and a quantitative analysis of the Delphi survey responses.

Health Science is a discipline of applied science where human health is studied to improve health, cure diseases and understand how humans function. The health science includes all the health professions departments at the Health Science Education Institution that train healthcare students to become competent healthcare professionals (Dewey, 2016:1). Experts of health science will determine consensus of items in developed instrument.

An *instrument* is a tool or device used to collect data for a particular task, especially for scientific work, (Polit & Beck, 2018:406). A new instrument in questionnaire form will be developed to measure the CLE through this study.

To *measure* means to assign numbers to indicate the amount of an item or behaviour present, in either an object or person using a set of rules. The instrument will be used to measure the elements of the CLE (Polit & Beck, 2018:181; Lo-Biondo & Haber, 2010:584).

Validity of an instrument refers to the true measurement of constructs and if the instrument performs, as it is designed to do (Polit & Beck, 2018:176; Botma, Greeff, Mulaudzi & Wright, 2010:174; LoBiondo-Wood & Haber, 2010:288). Face and content validity will be confirmed through a Delphi survey.

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CHAPTER 1

Overview of the study

1.1 INTRODUCTION

Students in health sciences rotate in the clinical environment as part of their assigned work-integrated learning (WIL), as stipulated by their respective health professions' governing bodies. The aim is to ensure that students' integrate classroom theory into the clinical practice so that they will become part of the envisaged skilled healthcare workforce of the World Health Organisation (WHO) by 2030 (WHO, 2016:27). Therefore, a suitable clinical learning environment (CLE) is crucial to students' learning. It can take on many forms, such as community home based care; primary healthcare clinics, or hospitals with their various patient units, e.g. emergency; intensive care; general medical; mental health, and maternity, to name but a few (Mabuda, Potgieter & Alberts, 2008:20). Apart from the integration of theory-practice, the CLE gives students an ideal opportunity to develop professionally.

Professional development contributes to a student's confidence, safe practice, and holistic people-centred care. The skills that students need to master include good communication with others; problem-solving; understanding their professional roles and the ability to master their learning outcomes (Anderson, Cant & Hood, 2014:519). The CLE provides a platform for students to rehearse their actions; improve their skills, and stimulates innovation in problem-solving. All these newly gained experiences contribute towards the higher levels of thinking that precede competence (Sercekus & Baskale, 2016:134; Dimitriadou, Papastavrou, Efstathiou & Theodorou, 2015:236; Anderson *et al.*, 2014:519). Even in the ideal CLE, students need support to develop their professional attributes and higher thinking skills.

There are several role-players that play a pivotal part in supporting students, including the clinical staff; peers; clinical facilitators and educators. Peers create a safe platform for students to ask questions if they feel uncertain about how to go about an assignment (Chuan & Bartnett, 2012:193). Preferably, clinical facilitators should link or liaise between the health science education institutions (HSEIs) and the clinical setting to encourage a supportive learning environment for students. This is known as system support (Botma, Hurter & Kotze, 2013:812). Facilitators, employed either by the HSEI or the clinical setting itself, should facilitate students' learning in the CLE (Sercekus & Baskale, 2016:134; WHO, 2016:16). A trusting relationship between students and facilitators is essential for the transfer of learning to take place (Thomson, Docherty & Duffy, 2017:514). Educators, usually part of the HSEI, should promote a platform of good collaboration and communication by providing students' learning outcomes to all involved role-players (Hooven, 2014:317).

Providing support for students and collaboration between healthcare professionals are essential to creating a high-quality CLE, as this influences students' motivation to learn (Msiska, Smith & Fawcett, 2014:36). Students who are left unsupported in the CLE have limited opportunities to learn as they lack confidence due to poor interpersonal relationships; poor communication and a lack of resources that negatively influences any motivation to transfer learning (Lovecchio, DiMattio & Hudacek, 2015:254; Chuan & Bartnett, 2012:192; Mannix, Wilkes & Luck, 2009:63). Aktas and Karabulut (2016:124) agree that students' motivation to learn in the CLE increases if they are supported.

As indicated, health professional students are dependent on a positive CLE for WIL. Health science education institutions are responsible for training and delivering competent professionals who can function in a highly demanding and complex healthcare setting. As the students progress through the clinical environment, their potential to develop professionally increases. They will grow in independence; use higher levels of thinking; learn to solve problems; develop an ethical conscience; practice safely, and acquire a sense of responsibility (D'Souza *et al.*, 2015:833). Students do not always experience a CLE as being positive, which subsequently has a negative impact on their motivation to learn; decreasing opportunities to

transfer learning and ultimately lowers their level of competence (Botma & MacKenzie, 2016:104; Msiska *et al.*, 2014:39). Smith (2012:181) concurs that a supportive and positive work environment and clinical experience make nurses flourish into professional competence.

1.2 BACKGROUND TO THE STUDY

Globally, the burden on the healthcare system mainly stems from a mismatch between the number of available healthcare workers and the healthcare requirements (WHO 2016:12). As a low-income country, South Africa requires a larger number of health practitioners due to the quadruple burden of disease, poor income, and the aging expert professional healthcare workforce (WHO, 2016:2; Department of Health, 2012:22). In an attempt to address this mismatch between supply and demand, the focus has been placed on HSEIs' to produce enough competent healthcare professionals to address the needs of their communities by 2030 (WHO, 2016:12; Botma & MacKenzie, 2016:104).

A competent professional can apply classroom knowledge in a context-specific clinical situation; think critically and reason clinically, while providing safe and holistic patient-centred care (Botma, Brysiewicz, Chipps, Mthembu & Phillips, 2014:124; Smith, 2012:172; Tanner, 2006:204). Furthermore, healthcare professionals should be able to continuously reflect on their actions and thinking processes to develop meta-cognition (Bruce & Klopper, 2017:318). Quality placements are therefore essential to promote competence, as students need the opportunity to transfer their learning to develop into skilled healthcare professionals (Donovan & Darcy, 2011:125).

Quality clinical placement is essential for learning to take place (Msiska *et al.*, 2014:36). There is a direct link between the quality of the CLE, and students' clinical experience and learning. D'Souza *et al.* (2015:833) interpret a CLE as being a cooperative network of different role-players within the clinical setting. Each role player contributes to the CLE, either in a positive or negative manner.

Dimitriadou *et al.* (2015:236) propose that it is not just the role-players that define the CLE, but also what surrounds a student including the clinical setting with its available equipment and supplies (Botma & MacKenzie, 2016:108; Msiska *et al.*, 2014:41). The work environment is described as an empowering milieu that provides students with appropriate functional equipment and an organisational ethos that strives towards excellence in patient care (Botma, Van Rensburg, Heyns & Coetzee, 2013:40). Open communication and close cooperation between role-players and commitment from all the stakeholders enhances the continuity of learning; creates opportunities to meet clinical outcomes and contributes to a good CLE (Aktas & Karabulut, 2016:128; Dimitriadou *et al.*, 2015:241; D'Souza *et al.*, 2015:838). All of these factors that influence students' transfer of learning in the CLE will ultimately create competent professionals.

Conversely, the unfortunate reality is that there is a universal lack of support from role-players in the CLE due to the shortages of experienced healthcare professionals in clinical settings. The high patient burden leads to clinical staff doing patient care themselves, leaving students without an opportunity to practice, or only to perform minor tasks (Botma & MacKenzie, 2016:104; Saarkoski, Warne, Kaila & Leino-Kilpi, 2009:595). Furthermore, due to severe economic shortages and poor management of funds in the healthcare sector, many clinical settings lack essential consumables, and equipment is often non-functional (Mburu & George, 2017:1; Msiska *et al.*, 2014:41). The limited time that a student spends with patients and the lack of support from supervising role-players leads to poor theory-practice integration; incompetence, and compromised patient safety. Msiska *et al.* (2014:35) emphasise that having clinical experience does not mean that students have learnt. It is learning that should be facilitated.

Qualitative studies, done in various countries, show that students often feel that working in a CLE is not beneficial to their learning. Bullying; negative attitudes towards them; lack of support; lack of functional equipment and / or supplies, and an overall adverse learning climate are just some of the statements that are regularly found in student reports (Aktas & Karabulut, 2016:124; Botma & MacKenzie, 2016:105; Smith, Gillespie, Brown & Grubb, 2016:505; Dimitriadou *et al.*, 2015:241; Msiska *et al.*, 2014:36; Chuan & Bartnett, 2012:196). When students' experiences

are negative, they are demotivated to learn, which leads to poor performance and a decrease in their competency (Donovan & Darcy, 2011:125). The measurement of the CLE is therefore important to ensure that students have the best opportunity to become experienced professionals.

In the past, measurement of the CLE has received global attention from researchers. Over time, various instruments have been developed and tested to measure the CLE (Mansutti *et al.*, 2017:64-66; Hooven, 2014:317-318). After scrutinising existing instruments, the researcher of this study concurs with Mansutti *et al.* (2017:70) that many, or even all of the instruments miss important and relevant aspects of the CLE, and therefore questions the validity of these existing instruments.

1.3 PROBLEM STATEMENT

A positive and stimulating CLE is a key component in preparing the future workforce. The evaluation of the CLE is crucial to determine the quality of the undergraduate health professional students' clinical experience and learning opportunities, as well as to ensure a supportive CLE for health professional students (Phillips, Mathew, Aktan & Catano, 2017:212). As stated, CLEs were measured by various instruments now found to be inadequate as none measured all the relevant aspects of a CLE (Mansutti *et al.*, 2017:70). Therefore, a more comprehensive, accredited and reliable tool is needed to measure the complex characteristics of CLEs, and to determine whether they provide the essential learning requirements for undergraduate health professional students (Mansutti *et al.*, 2017:60; Gustafsson, Blomberg & Holmefur, 2015:257).

Evidence obtained by a comprehensive holistic instrument would allow educators to select good clinical facilities for health professional students' WIL; effectively support undergraduate health professional students in the CLE; improve the learning transfer climate; promote good collaboration between role players and identify limitations in clinical facilities. Furthermore, educators would be able to make informed decisions on where, and when, to place their health professional students.

Data collected by using such an instrument may indicate existing weaknesses in the system that need strengthening, or specific aspects to sustain and reward.

1.4 RESEARCH QUESTION

The research question for this study will be phrased as follows: *How can an instrument be developed to measure the CLE of students in health science?*

1.5 RESEARCH AIM AND OBJECTIVES

This research aims to develop an instrument that measures the clinical learning environments of students in health sciences.

The research objectives for this study are to:

Develop an instrument that measures the clinical learning environment based on pre-existing instruments and literature. Presented as Phase 1.

Determine the face and content validity of the draft instrument. Presented as Phase 2.

1.6 CONCEPTUAL FRAMEWORK

A conceptual framework is a schematic representation of the theory the researcher has studied. It provides an organized visual map of the different concepts or phenomena and demonstrates links and relationships between the concepts in the study (Polit & Beck, 2012:722; Botma, Greeff, Mulaudzi & Wright, 2010:271; LoBiondo-Wood & Haber, 2010:575). Figure 1.1 shows the relationship between the different role-players and demonstrates the clinical learning environment's conceptual framework.

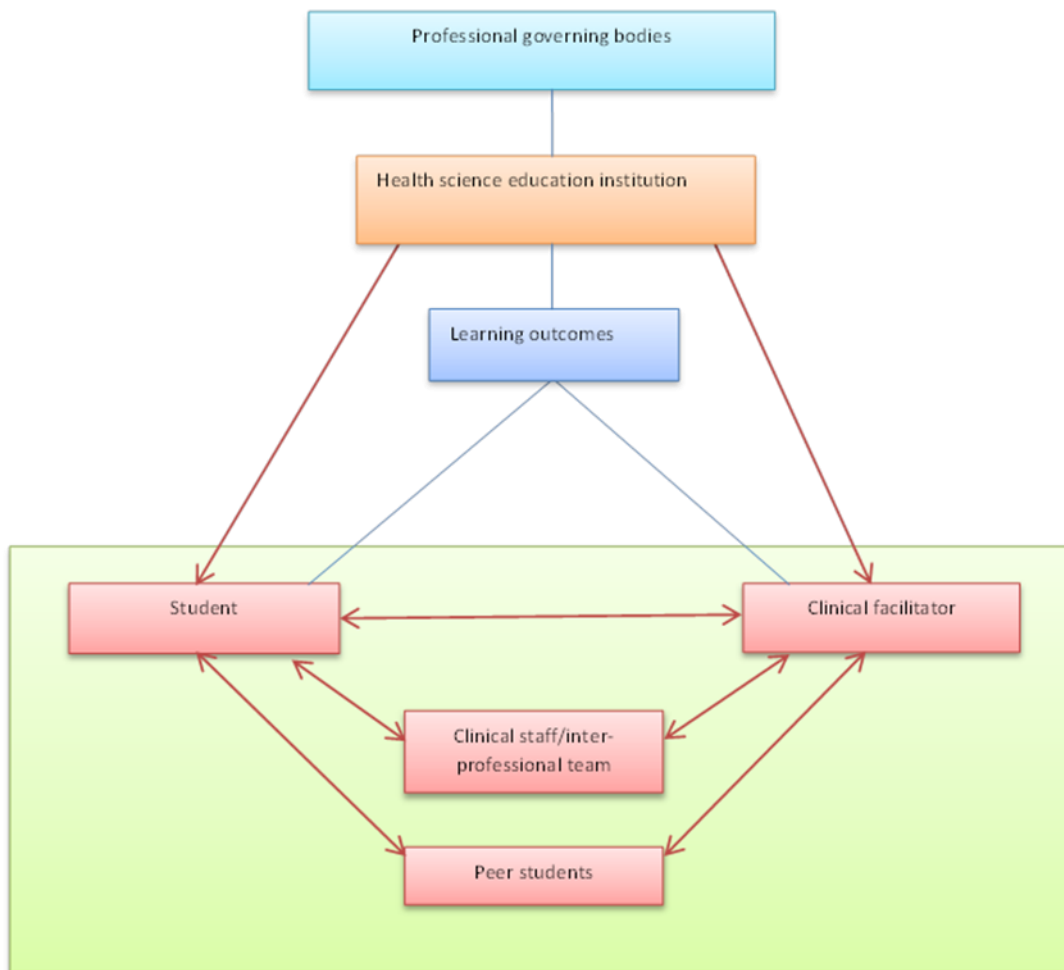


FIGURE 1.1: Conceptual framework of the CLE (adopted from Botma, et al., 2013)

The relevant role-players include 1) *Students*, who are the key focus of all the activities in the clinical education setting; 2) *Clinical staff*, that includes the inter-professional team and *clinical facilitators* responsible for students' learning; 3) *Peer students*, who support fellow health professional students in the clinical settings; 4) *Clinical settings*, where clinical learning takes place; 5) *HSEIs*, who are responsible for the formal education programmes, and lastly 6) *Professional governing bodies*, who set the standards for legal practice and education. The clinical setting in which health professional students are placed for WIL is known as the CLE.

The CLE consists of the atmosphere created by a clinical setting, including the learning transfer climate; the organisational ethos; communication, and the availability of resources. It also includes the teamwork between role-players; the workload of health professional students and clinical staff, and the learning opportunities offered by clinical settings. The researcher wants to measure the CLE with a reliable and valid instrument that would provide HSEIs with the best chance of developing competent healthcare professionals.

1.7 METHODOLOGY

A quantitative research approach was followed. Quantitative research follows a prescribed, objective, systematic process to investigate phenomena that lend themselves to precise measurement (Grove, Burns & Gray, 2013:23; Polit & Beck, 2012:739). A detailed plan was established to ensure the continuous quality of the research method.

1.7.1 Research design

A methodological research design as described by Polit and Beck (2012:268) and LoBiondo-Wood and Haber (2010:207) was used to develop the instrument. As this type of design defines the concept being measured (a CLE), it assists the researcher to formulate items, and determine their face and content validity (LoBiondo-Wood & Haber, 2010:207).

In this study, the researcher has developed the instrument and determined its face and content validity.

The development and evaluation processes were done systematically. As depicted in Figure 1.2, the research unfolded in two phases.

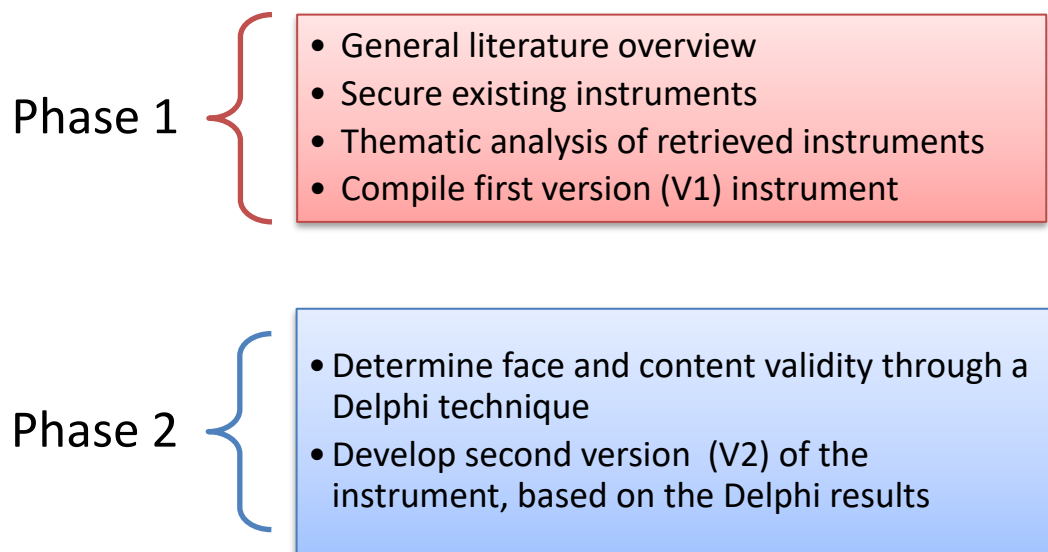


FIGURE 1.2: Phases in the development of the instrument

The first phase describes the construction of the instrument, while Phase 2 establishes face and content validity. In Phase 1, the researcher completed a general literature overview; secured the available existing measuring instruments; thematised extracted items from them, and compiled the first version instrument.

An expert panel confirmed the content and face validity of the instrument through a Delphi study technique in Phase 2.

1.8 PHASE 1: DEVELOPMENT OF THE DRAFT INSTRUMENT

The development of an instrument is a complex and lengthy process (Grove *et al.*, 2013:255) and careful planning was needed for the process, as a well-developed instrument contributes greatly to a valid and reliable CLE assessment (Polit & Beck, 2012:295).

Multi-item summated rating scales are ideal to measure respondents' opinions and experiences on a specific subject. The researcher had chosen a self-administered Likert scale to quantify data on the CLE. Likert scales determine opinion or attitude towards a topic and always have a choice of several declarative items with their response options (Grove *et al.*, 2013:430; Polit & Beck, 2012:45).

The development of an instrument included that the researcher familiarise herself with any relevant literature, and find the existing instruments available to measure a CLE. A general overview of the literature was therefore completed to identify important aspects or themes for measuring CLEs, and to identify which existing instruments were still available.

1.8.1 General overview of the literature

As indicated, the development of the new instrument commenced with a general overview of existing literature. Polit and Beck (2012:351) concur that sound conceptualisation of the construct being measured is crucial in developing an instrument. Therefore, the researcher had to acquaint herself with the literature available on the assessment of CLEs to determine which aspects needed to be captured in the new instrument, as well as those present in existing instruments (described in Chapter 2).

1.8.2 Securing existing instruments

The researcher followed the three steps described by Paré and Kitsiou (2017:158) to procure existing instruments:

- Step 1:** Formulate the research objective(s)
- Step 2:** Search existent literature
- Step 3:** Screen for inclusion.

The next section of this chapter provides a general overview of this process, as it will be discussed in more detail in Chapter 3.

1.8.2.1 *Step 1: Formulating the research objective*

It was already established that a comprehensive instrument is needed to measure the CLEs. Therefore, the objective of this section of the study was to find existing accredited instruments in published articles as basis to compile a new instrument that would measure all the aspects of the CLE. The acronym of the process that was applied to reach this goal - PICOT - consists of the themes population (P); intervention (I); comparison of interest (C); outcome (O), and time (T) (Polit & Beck, 2012:36).

The PICOT research question was phrased as: Which instruments measuring the CLE in health science professions are available since 1980 to develop a new instrument?

It has only been since the early 1980s that the National Department of Health and Welfare had agreed to the integration of most of the healthcare professions into a higher education system (Horwitz, 2011:3), thus this information was integrated in the search.

1.8.2.2 *Step 2: Searching the existing literature*

The following search string was used to execute the literature search:

“health science” or “healthcare professions” or “health care professions” or
“health care professionals” or dietetics or paramedics or medicine or nursing
or physiotherapy or optometry or “occupational therapy” or pharmacy or
dentistry or biogenetics or radiography or paramedics

AND

“clinical learning environment” or “transfer climate” or "organizational climate" or "work-integrated learning" or "clinical learning" or "placement learning" or "organizational work climate" or "psychological climate" or "practice placement" or "transfer environment" or “learning climate”

AND

Instrument or questionnaire or tool or surveyor "self-administered questionnaire" or scale or inventory or evaluation or assessment or measurement

AND

1980 to December 2019.

Fifteen scientific databases were used, including Medline with Full Text; PsycINFO; Africa Wide Information; Cumulative Index to Nursing and Allied Health (CINAHL) with full text; Educational Resources Information Centre (ERIC); Academic Search Ultimate; Education Source; PsycTESTS; Health Source: Nursing / Academic Edition; Science direct; SocINDEX with Full Text; PsycARTICLES. The researcher and her supervisor screened the titles and abstracts with a view of inclusion in the new measuring instrument.

1.8.2.3 *Step 3: Screening for inclusion*

The researcher and supervisor included articles in the preliminary search list that met the inclusion criteria, which comprised of the following:

Abstracts that described the measurement of the CLE

Abstracts with reference to an instrument that had been used to describe the quality of the CLE

Articles without full-length questionnaires, but including the items used to measure the CLE

Full-length questionnaires

English versions of instruments

Only instruments relevant to health science professions.

In the end, the researcher identified 19 different existing instruments. Details regarding this process are described in detail in Chapter 3.

1.8.3 Thematising extracted items

Existing instruments had served as the qualitative dataset. The researcher, her supervisor, and an expert in instrument development conducted an inductive content analysis of the existing instruments' items. From the thematic analysis, the researcher developed the first version of the draft instrument, keeping to set guidelines regarding item formulation. These guidelines included the precision of items; removal of reversed scores; and avoidance of jargon, too long sentences, leading statements, double negatives and double-barrelled items (Polit & Beck, 2012:355). Finally, 454 items were extracted from the existing instruments, from which 66 new items were formulated for the first version of the new instrument.

Four numerical response options were provided for students in the format of a Likert scale. The options included "Strongly agree"; "Agree"; "Disagree" and "Strongly disagree". The options were rated. A 4 equalled "Strongly agree"; 3 "Agree"; 2 "Disagree" and 1 "Strongly disagree".

The first draft instrument was consequently submitted to an expert Healthcare professionals' panel to confirm face and content validity in Phase 2.

1.9 PHASE 2: FACE AND CONTENT VALIDITY

The validity of an instrument refers to true measurement of concepts' relevant attributes (Polit & Beck, 2012:175; Botma *et al.*, 2010:174; LoBiondo-Wood & Haber, 2010:288). Face validity verified that the instrument appeared to measure the content of the study (Grove *et al.*, 2013:694). On the other hand, content validity determines the degree to which the developed instrument includes all the major aspects relevant to the CLE (Polit & Beck, 2012:175). The new instrument's content validity was also established. Evidence for face and content validation was obtained by the use of a Delphi technique.

1.9.1 Delphi technique

A Delphi technique is a way to measure a group of experts' judgment, or to seek consensus about a certain topic (Grove *et al.*, 2013:435; Polit & Beck, 2012:267). The technique involves the participation of a selected group of experts in a series of repeating evaluation rounds. The anonymity in the data collection process is one of the biggest advantages of using a Delphi technique (Waggoner, Carline & Durning, 2016:666). This benefit was utilised by the researcher electronically contacting the selected experts individually, thus preventing external access to the panel members' identities or responses. The members of the panel of experts were invited to measure the draft instrument to measure whether 1) It was relevant and appeared to measure all the aspects of the CLE, and 2) Whether all the relevant elements of a CLE were included and comprehensible.

1.9.2 Population and sampling

Evidence for face and content validation can be obtained from experts in the field of study (Grove *et al.*, 2013:690; Polit & Beck, 2012:336). Purposive selection and snowball sampling allowed the researcher to identify appropriate professional healthcare experts. In this phase of the research process, the researcher invited national and international experts from different healthcare professions to participate in the study. The healthcare professionals included qualified biokineticists;

dietitians; dentists; nurses; occupational therapists; optometrists; paramedics; physio-therapists; medical physicians; pharmacists and radiographers. Furthermore, the list included experts from different health science institutions and African countries, as the researcher was of the opinion that this would promote a wider, more inclusive view of the instrument and improve the level of evaluating experience in the study. All students in health sciences programmes must be placed for WIL in CLEs as part of their training.

The following criteria were used to identify suitable experts for the panel: Persons with a Bachelor's degree in health science; at least five years' professional clinical experience, and specialising in either education, clinical accompaniment or supervision of health professional students in the CLE. These qualities enhanced the value of the generated data by the end of the study (Giannarou & Zervas, 2014:67; Hsu & Sandford, 2007:3).

Researchers recommend that including between 10 and 15 respondents in a Delphi study is sufficient to ensure validity (Falzarano & Pinto Zipp, 2013:100; Giannarou & Zervas, 2014:67; Waggoner *et al.*, 2016:664). The researcher invited 54 experts, to ensure the inclusiveness of all healthcare professions, and because high attrition rates are associated with Delphi studies (Green, 2014:6; Hsu & Sandford, 2007:4).

1.9.3 Data collection

Electronic communication was sent to the identified experts, asking whether they met the set criteria, and if they would be interested in participating in the Delphi study. If they did not fit the criteria themselves, they were requested to refer other potential experts to the researcher for possible participation in the research. The instrument and consent form (see Addendum B and C1) were subsequently sent to those respondents who had shown an interest in the study.

The experts assessed the draft instrument by way of a specially designed Delphi feedback form. The feedback form contained the themes and CLE assessment items that the researcher had identified during the initial extraction process.

The expert panel were to appraise the items as being “Essential” in a new instrument; “Uncertain” or “not needed”. Space was provided for respondents' comments or motivations. The researcher also provided a section for experts to add vital elements of the CLE which they felt had not been included in the draft instrument.

After the first round, the researcher and her supervisor analysed the panels' responses. A percentage was calculated for each item on the instrument and confirmed with the biostatistician. The researcher provided feedback to the experts when an item did not achieve panel consensus. The summarised responses from the first and second rounds were then routed back to the panel in the consecutive rounds (Falzarano & Pinto Zipp, 2013:103). The Delphi rounds continued until a satisfactory consensus rate for each item was reached, three Delphi rounds later. After the third round appropriate changes were made and the second version of the instrument was compiled. A total of 62 items were included in the final draft instrument. This final instrument will be subjected to further testing which does not form part of this research study.

1.9.4 Data analysis

The feedback was statistically analysed. Descriptive statistics were compiled by the researcher and verified by the biostatistician to calculate percentages for the data. As suggested by Humphrey-Murto, Varpio, Gonsalves and Wood (2017:18), Falzarano and Pinto Zipp (2013:102), Balasubramanian and Agarwal (2012:21), and Hsu and Standford (2007:4), a 70% consensus inclusion criterion was selected for an item to be viewed to be face and content valid.

1.10 MEASUREMENT ERRORS

As stated, extracting and matching themes of relevant items from the existing instruments was done by the researcher, her supervisor, and a departmental expert in instrument development. Confirmation of the extracted, thematised items by 'n team and consensus on the items by the expert panel contributed to the trustworthiness of the draft instrument. The researcher's supervisor and biostatistician continually validated data to minimise the development of any possible errors.

Completion of the Delphi study had limitations that could have affected the data and the overall validity of the study. The low response rate of participants was a concern, as was the instability of the panel of experts, which could have lead to measurement errors. Although the respondents had all indicated their willingness to participate in the study, the attrition rate was still high. Balasubramanian and Agarwal (2012:21) recommend a period of two weeks for feedback from the experts and a minimum of forty-five days for the administration of a Delphi study. To keep the attrition rate as low as possible, the researcher extended feedback times according to the observations submitted by the expert panel. Reminders of their feedback were sent out to panel members one week before the submission date. Falzarano and Pinto Zipp (2013:99) state that well-defined communication between the researcher and respondents is needed to smooth the process and return high-quality data.

1.11 ETHICAL CONSIDERATIONS

Three ethical principles to consider when conducting any research study include respect for people; beneficence and non-maleficence, and distributive justice (Polit & Beck, 2012:152; Botma *et al.*, 2010:17). The South African National Department of Health (2015:14) identified eight key norms and standards to follow when performing research with people. Their key norms and standards are the relevance and value of the study; scientific integrity; role player engagement; a favourable risk-benefit ratio; fair selection of participants; informed consent; ongoing respect for enrolled participants, and research competence and expertise. Application of these key

norms and standards was considered throughout this study and are discussed in detail in Chapter 3.

1.11.1 Relevance and value

This study has produced a newly developed draft instrument that can comprehensively measure a CLE. The new instrument will enable HSEIs to select placements for their students' WIL in appropriately validated CLEs. Good quality placements will promote students' competence, and subsequently the quality of patient care they will deliver.

1.11.2 Scientific integrity

The proposed research study was approved by an evaluation committee from the University of the Free States' School of Nursing before it was sent to the University's Health Science Research Ethics Committee for ethics approval. On receiving the approval, the researcher accepted that the study was found to be sound and correct, based on her fellow researchers' approval. The student completed the study under the guidance of her supervisor, who is an expert-user of the methodology and has published articles on the topic.

1.11.3 Role player engagement

Engagement of relevant role-players includes selection and utilization of the knowledge of key experts, who assisted in confirmation of the face and content validity of the draft instrument in a Delphi study. The experts were invited electronically to participate, and responded anonymously.

1.11.4 Favourable risk-benefit ratio

The principle of a favourable risk-benefit ratio is grounded in respondents' right to be protected from any harm and discomfort during research (Brink, van der Walt & van Rensburg, 2012:36; Botma *et al.*, 2010:20). The researcher did not foresee any discomfort to participating experts except for the time that would be required to complete the assessment instrument. The experts would not benefit directly from this study, but future health professional students would benefit from application of a new CLE measuring tool.

1.11.5 Fair selection of participants

Due to the nature of the study, the researcher purposively selected experts and applied snowball sampling to identify professional healthcare practitioners who fit the pre-set criteria, as discussed in Section 1.9.2 and Chapter 3.

1.11.6 Informed consent

Information regarding the research was communicated electronically by information leaflet (Addendum B). Each respondent had the right to decide whether he / she wanted to participate in the study, and could stop or withdraw without any consequences at any time (Polit & Beck, 2012:154). All uncertainties were clarified prior to participation. The researcher communicated all information via email. One week was given for participants to respond to clarifications and decision-making. Due to the anonymity of the respondents, only those who showed an interest in voluntary participation were included in the Delphi study, without any remuneration or power coercion whatsoever.

1.11.7 Ongoing respect for enrolled participants

Research respondents have the right to privacy and confidentiality. Confidentiality was maintained throughout the study, as only the research team directly involved had access to portions of information about the respondents. The researcher processed the data herself, while the supervisor and biostatistician validated the anonymous results afterwards. Data were stored on an external hard drive in a locked, steel cupboard with limited access in the researcher's office, until finalisation of the report. Data will be kept for a minimum of 15 years, per University policy.

1.11.8 Research competence and expertise

Lastly, the researcher functioned under supervision of an academic qualified in the field of study. The supervisor ensured that the researcher followed the University's approved protocol to maintain the integrity of the study (DOH, 2015:16). These norms and standards were viewed as essential ethical considerations throughout this study.

The study's structure is described in the following section.

1.12 OVERVIEW OF CHAPTERS

This study consists of five chapters, structured as follows:

Chapter 1: Provides a background of the study, with a problem statement; research aim; objectives and questions, as well as the scope and meaning of the study.

Chapter 2: Outlines the theoretical framework of the study and an overview of literature concerning factors that influence and measure the CLE of health science students.

Chapter 3: Focuses on the methodological approach of the study. It presents the ethical research design and setting, as well as the sampling procedures, before describing data collection methods and data analysis.

Chapter 4: Presents a description, presentation and interpretation of the findings. This is based on the results of the consensus Delphi study done to establish face and content validity of the draft instrument.

Chapter 5: Presents the conclusions of the study, limitations found in the study and recommendations for future research. Here the findings are discussed in answer to the posed research questions. This chapter also outlines the envisaged value of the study for the role-players involved in student development, before finishing off with a conclusion statement.

1.13 SUMMARY

The healthcare sector faces challenges to produce enough competent healthcare professionals to address the healthcare needs of society. The WHO has called upon HSEIs to deliver competent healthcare professionals who can take the pace and scientific complexity of the professions they have chosen. The quality of a CLE plays an essential role in enabling a student to transfer classroom learning to clinical settings through WIL, and ultimately become competent practitioners. Various aspects influence the quality of the CLE. To date, no single assessment instrument had been able to measure all the aspects of a CLE. A comprehensive overview of the CLE provides valuable information to HSEIs, assisting them in the choice of effective placements for their health professional students. An instrument to measure the CLE comprehensively was therefore needed and developed.

In the following chapter, the literature overview of the study will be described.

CHAPTER 2

Overview of the literature

2.1 INTRODUCTION

The literature chapter aims to provide evidence of an in-depth overview of the literature that was consulted during the study. The overview is a summary of existing scientific knowledge that relates directly or indirectly to the research topic. Literature overview gives the researcher an understanding of issues on the investigated topic, and guidance on how to go about exploring it while supporting the research problem (Du Plooy-Cilliers, Davis & Bezuidenhout, 2014:101; Grove *et al.*, 2013:98-100; Botma, Greeff, Mulaudzi & Wright, 2010:64).

In this chapter, the researcher explored literature on the clinical learning environment (CLE) and investigated aspects influencing the environment. The researcher then documented the current learning situation of a number of healthcare professionals and explores the role that health science education institutions (HSEIs) presently play in developing competent healthcare professionals. In the process, some training programmes were reviewed.

Most of the HSEI make use of competency-based curricula globally (Gruppen, Mangrulkar & Kolars, 2012:1). Health professional students are placed in the clinical settings as part of their work-integrated learning program (WIL). The clinical learning environment is seen as a vital component of students' training to meet their learning outcomes and to become professionally competent.

The CLE has been divided into four pillars by the researcher, consisting of the atmosphere in the clinical setting, teamwork, work load and the learning opportunities found in a clinical setting. All four these pillars were investigated to understand better what each entails and how they influence student learning. Critical aspects of each were identified and how they could positively contribute to

an ideal CLE has been documented. An overview of the available literature identified various aspects in the clinical setting as pivotal to the development of professional competence in health professional students. The researcher furthermore reviewed existing CLE assessment instruments with regard to their application of the crucial aspects that were identified to determine if a relevant, comprehensive instrument are available to measure the CLE.

2.2 THE CURRENT SITUATION RE HEALTHCARE PROFESSIONALS

There is a worldwide mismatch between the number of healthcare professionals required by society and the delivery of competent healthcare professionals (WHO, 2016:11). This discrepancy places a burden on healthcare delivery around the world. The burden is further increased by evolving epidemiology profiles, high prevalence of disease and the rapid population growth (World Health Organisation [WHO], 2016:12; Institute for Health Metrics and Evaluation, Human Development Network [IHME], 2013:958). There is also a decrease in the available number of trained, expert healthcare professionals due to the progressive aging of the healthcare community and migration of healthcare professionals abroad (Braithwaite, 2018:1; Department of Health [DoH], 2011:22; Armstrong & Rispel, 2015:1). Existing data suggests that Africa, including South Africa, has a significant shortage of healthcare professionals in comparison to other continents; a situation that is expected to worsen in the future (WHO 2016:24, 44). Rispel (2015:2) highlighted that the shortages of healthcare professionals should be prioritised and addressed in order to meet their communities' future healthcare needs.

In an attempt to address the shortage of healthcare professionals while promoting universal health coverage (UHC), WHO developed a Global Strategy on Human Resources for Health: Workforce 2030. This global strategy is aligned with the WHO's framework for integrated people-centred health services. Integrated people-centred healthcare is the delivery of services in such a way that it ensures that a continuum of healthcare is delivered that focuses on the needs and expectations of the people and their communities, and not just on disease (WHO, 2017:Online). The

WHO's goal is to promote UHC - also known as united healthcare - by aligning human resources for health with the current and future healthcare needs of the population and health systems. Requirements for implementation of the global strategy aimed to measure and address the demand for healthcare professionals by 2030 (WHO 2016:14).

In an attempt to address the healthcare professional shortages and promote UHC, the South African Department of Health (DoH) has arranged its health priorities according to the WHO's goals, thus aligning human resources with the healthcare needs of the country (Rispel, 2015:1; DoH 1997:8; DoH 2013:17). Evidence shows that healthcare professional shortages could be addressed through the upscaling of skills, knowledge and attributes, recognised as the key competencies of healthcare professionals (Health Professions Council of South Africa [HPCSA], 2018:10; Hasske, Beil & Keller, 2017:1; Gruppen, Mangrulkar & Kolars, 2012:1). Muraraneza and Mtshali (2018:53) added that an increase in skills and knowledge in healthcare professionals improves the quality of patient care. The WHO matches competencies to peoples' needs, implying that healthcare professionals must be able to apply knowledge and skills in practice (Langins & Borgermans, 2015:3). In 2012, the Director-General of Health of the South African DoH indicated that staff shortages and lack of competence among healthcare professionals could be addressed by HSEIs focusing on education and training as an area of concern (Muraraneza & Mtshali, 2018:53; Health Professionals Council of South Africa [HPCSA], 2018:19; Nancarrow, 2015:2; The Nursing Summit Organising Committee and Ministerial Task Team, 2012:33). The importance of HSEIs' role cannot be denied in the output of graduate healthcare practitioners.

2.3 HEALTH SCIENCE EDUCATION INSTITUTIONS

Health Science Education Institutions (HSEIs) are tasked with the responsibility to deliver sufficient independent, competent healthcare professional graduates to meet the requirements of the healthcare system and the needs of communities, while also addressing the shortage of healthcare professionals in society. Professional governing bodies have identified that South African healthcare professionals'

education and training falls short on student output (HPCSA, 2018:23; Armstrong & Rispel, 2015:2; The Nursing Education Stakeholders [NES] 2012:14). The South African professional governing bodies include the Health Professions Council of South Africa (HPCSA); the South African Nursing Council (SANC), and the South African Pharmacy Council (SAPC). These organisations argue that a reason for the shortfall is a poor integration of theory and practice that directly reflects on the level of competence of trained healthcare professionals (Sercekus & Baskale, 2016:137).

Integration of theory and practice should be the main purpose of HSEI training programmes. Hugo and Botma (2016:17) correlate the integration of theory and practice as synonymous to the transfer of learning. Transfer of learning refers to the student's ability to apply newly gained knowledge, practical skills, and attitudes in the CLE while rendering quality people-centred care (Abed *et al.* 2015:460; Donovan & Darcy, 2011:122). McCormack Tutt, (2019:41) and Botma, van Rensburg, Heyns & Coetzee, (2013:41) concur that an effective transfer of learning will contribute to students' professional maturity and increase their levels of competence.

With the focus on competence, an improved educational system is necessary to ensure that current and future generations of healthcare professionals can provide safe, high quality, people-centred care (Muraraneza & Mtshali, 2018:53; HPCSA, 2018:10; NES, 2012:14). Therefore, it is vital to not just focus on increasing the number of healthcare professionals to address the shortages, but to ensure that the levels of competence of healthcare professionals can meet the high demands and cope with the dynamic and challenging healthcare environment (NES, 2012:17). Consequently, training programmes for health science professionals should have a competency-based curriculum. Muraraneza and Mtshali (2018:53) note that a competency-based curriculum is a benchmark for transforming the education and training of the health workforce. Transformation includes promoting current and future healthcare needs by addressing shortages and competency levels of healthcare professionals. This focus on student transformation into competent professionals falls in line with the WHO goals and the DoH's strategy to promote human resources and UHC.

2.4 TRAINING PROGRAMMES OF HSEIs IN SOUTH AFRICA

The healthcare needs of society and patients determine the competencies that health professional students should accomplish during their education and training period (Mellish, 2016:228; Gruppen *et al.*, 2012:1). Health science training programmes in South Africa should follow a competency or outcome-based curriculum, as prescribed by their respective professional governing bodies to promote competence in health professional students (Muraraneza & Mtshali, 2018:53; Department of Health, 2013:91). Competency-based curricula prepare and transform health professional students into a competent healthcare workforce to address healthcare priorities and improved health outcomes of the population (Muraraneza & Mtshali, 2018:53; Gruppen *et al.*, 2012:1). To implement competency-based curricula, the HSEIs would identify the health needs of their community; define competencies; develop self-regulated and flexible learning options for students, and assess health professional students for competence (See Figure 2.1). A competency-based curriculum will ultimately improve people-centred care through improved preparation of healthcare professionals (Parson, Childs & Elzie, 2018:207). Hasske *et al.* (2017:12) state that the success of a competency-based curriculum depends on clinical support to enhance theory-practice integration, leading to an increased transfer in learning.

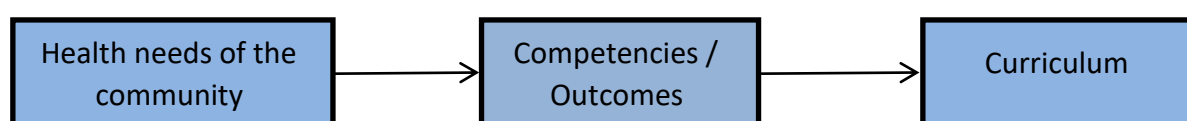


FIGURE 2.1: Competency-based curricula (Gruppen *et al.*, 2012:3)

Competent healthcare professionals apply classroom knowledge to a context-specific clinical situation, whereby he or she can think critically and use their problem-solving skills while providing safe and holistic patient care (Botma *et al.*, 2014:124; Smith, 2012:172; Tanner, 2006:20). Furthermore, healthcare professionals should be able to reflect on their actions and thinking operations to develop meta-cognition (Bruce & Kloppe, 2017:318). Health science education institutions should use educational training designs that develop students' thinking

operations, such as critical thinking; clinical reasoning; clinical judgment and metacognition (Tanner, 2006:204). Evidence of health professional students' learning and skills are obtained through integrated assessments of different competencies in the clinical setting (Biggs & Tang, 2011:130; CHE, 2011:32).

The competencies should reflect the healthcare needs of the community, and the specific goals of education, but also include the performance acquirements of the health profession studied. The Health Professions Council of South Africa (HPCSA), (2014:2) and Dolamo (2018:3) highlighted that key performance acquirements determine the competencies that are expected from health professional students at the end of their training programme, in order to enter their profession. An analysis of key performance areas determines the profile of the specific healthcare profession (Gruppen *et al.*, 2012:1). In South Africa, the HSEIs focus on using applied competencies. Applied competencies demonstrate the types of ability students should master in the clinical setting as a result of learning (HPCSA, 2014:1; CHE, 2011:27). Health professional students need to demonstrate the mastering of these competencies as they progress through their training programmes (Mellish, 2016:227).

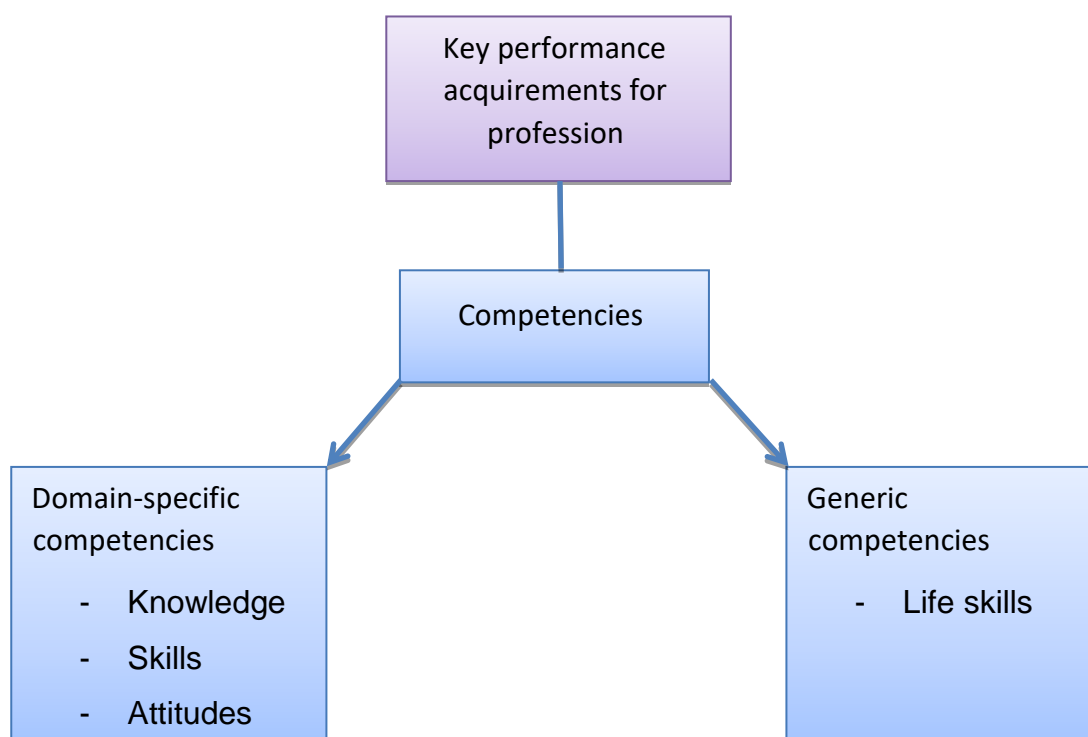


FIGURE 2.2: Performance acquirements of health professional students

The competencies are broken down into domain-specific competencies and generic competencies (See Figure 2.2). The domain-specific competencies include clusters of knowledge, skills, and attitudes of specific content that relate to the profession. Specific content, for example, includes professionalism; leadership and management; communication; health advocacy; ethics, etc. (Parson *et al*, 2018:209; Mellish, 2016:228; HPCSA, 2014:1; Smith, 2012:172). Generic competencies are life skills that can be transferred to any professional setting or life situation (Mellish, 2016:229). Examples of generic competencies include problem-solving; critical thinking; clinical reasoning; clinical judgement; time management, and reflection (Mellish, 2016:229). Health professional students' proficiencies should include foundational, practical and reflective competence, which should be developed during their training programmes.

Health professional students include students who enroll in training programmes at a Faculty of Health Science, and comprise of medical, nursing, biokinetics, dentistry, dietetics, paramedic, pharmacy, physiotherapy, occupational health and optometrist careers. All Health Science Education programmes contain both theoretical and practical components. In the same manner, all health science programmes require the placement of their students in clinical settings to develop competency during their education and training programmes. The theoretical components are solely the responsibility of the HSEIs, while the practical components are delivered through a collaborative effort by the HSEI and the clinical settings in the healthcare system.

2.5 CLINICAL PLACEMENTS OF HSEI's STUDENTS IN SOUTH AFRICA

Health professional students are placed in the clinical environment as part of work-integrated learning (WIL). The number of hours of WIL is determined by the respective professional governing bodies. It is in the CLE where students have the opportunity to integrate their classroom knowledge and practice (CHE, 2011:4). Clinical settings represent a professional work environment where priority falls on providing quality people-centred care, and facilitation of health professional students' learning takes second place.

The direct transfer of newly learned knowledge from HSEI training programmes to the clinical settings is the most critical stage in the training process, and takes place in the social and complex clinical environment (Hooven, 2015:421; Chan, 2002:517). Due to the complexity of the theory-practice integration process within the clinical environment, student support is critical. Clinical learning must have a student-centred approach, where health professional students are afforded the opportunity to engage in active learning, with job requirements as well as an organisational climate and ethos (Botma & Mackenzie, 2016:105). It is estimated that only forty percent of the theoretic training content will be transferred to the workplace, if applied immediately. The transfer percentage declines as time passes (Abed *et al.*, 2015:463). It is therefore important to provide adequate learning opportunities for health professional students to transfer their knowledge. Another factor that may influence the transfer of learning may be because health professional students are often less motivated to retain and use their knowledge (Donovan & Darcy, 2011:124). This emphasises the importance of providing support and the training design used to create a positive CLE for health professional students to transfer their learning (Hugo, Botma & Raubenheimer, 2018:83; Donovan & Darcy, 2011:133).

A positive CLE for student placement is seen as an environment that accepts health professional students and allows them to obtain competency by participating in the delivery of quality people-centred care (Hooven, 2015:422; Anderson *et al.* 2014:519). To enhance the quality of training in a positive CLE, is it essential for both the health and the education systems to support health professional students (Phuma-Ngaiyaye, Bvumbwe & Chipeta, 2017:164; Phillips, Mathew, Aktan & Catano, 2017:205; Papastavrou, Dimitriadou, Tsangari & Andreou, 2016:2; Botma *et al.*, 2013:32). Figure 2.3 lists the health systems and education systems that support health professional students.

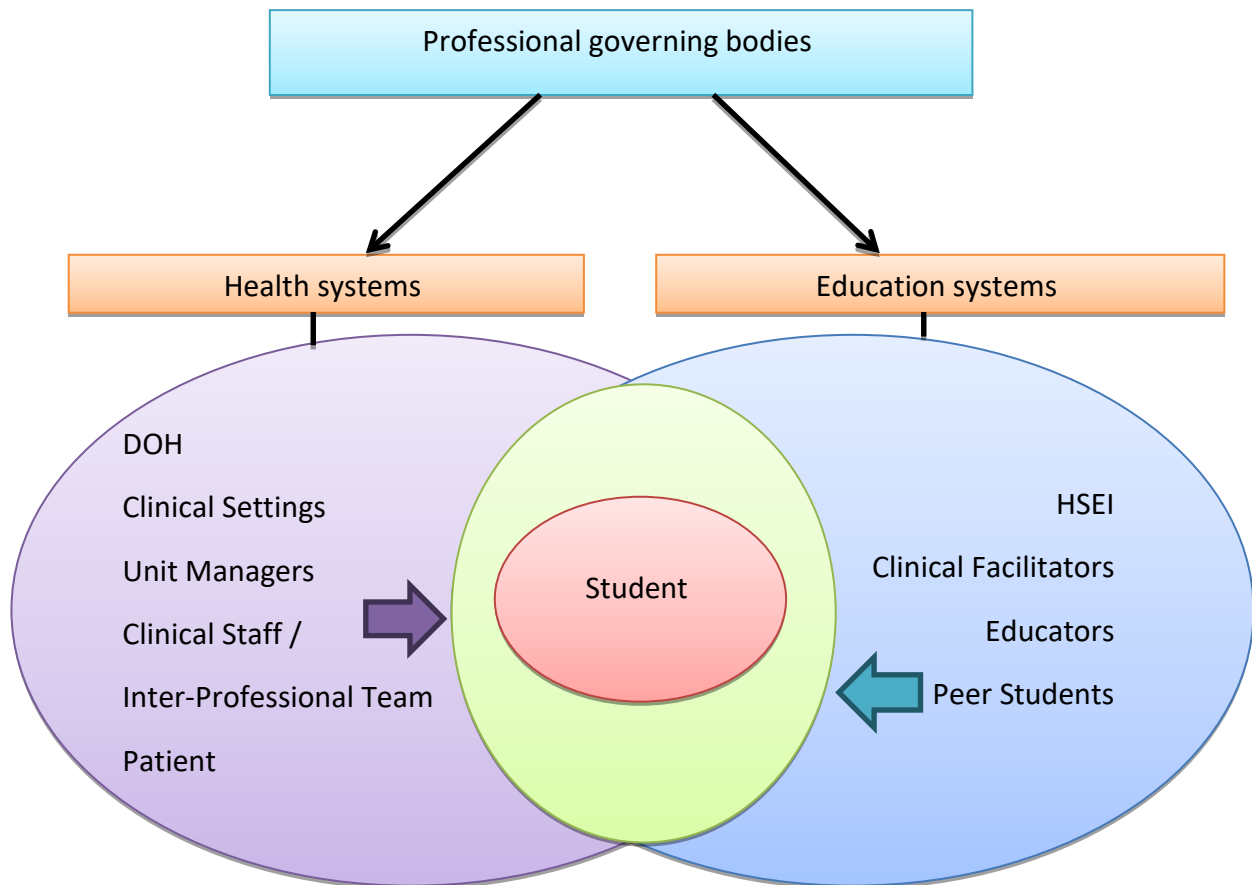


FIGURE 2.3: Identified supporters of health professional students' learning

Individual professional governing bodies set the standards for practice and education in both the health system and the education system. The health system includes the Department of Health who oversees the operation of clinical settings. The unit manager manages the units/wards in the clinical setting; the clinical staff and inter-professional healthcare team functions effectively to promote that people-centred care is delivered to all healthcare consumers. The effective functioning of the health system contributes to quality student learning to deliver patient care.

The professional governing bodies have a responsibility to ensure accreditation of HSEIs as education and training facilities, as well as the clinical settings for quality scientific student learning. The education system includes the HSEI that manage the health science education and training programmes, and select appropriate clinical settings for health professional students' practical placements. Educators oversee

mainly the theoretical component of the training programmes; while clinical facilitators (appointed by the HSEIs) support clinical learning in the health system. The education system also acknowledges the role of peer students in the system, that assist one another while placed in clinical settings for WIL. The health and the education systems are both important contributors to the CLE of health professional students.

A collaborative approach to health professional students' clinical learning and professional development is crucial. Hugo and Botma (2019:195) concur that a collective approach is needed between health and education systems to promote competence in students. The conceptual framework of a CLE (as adopted from Botma *et al.*, 2013), likewise highlights essential role-players in the CLE.

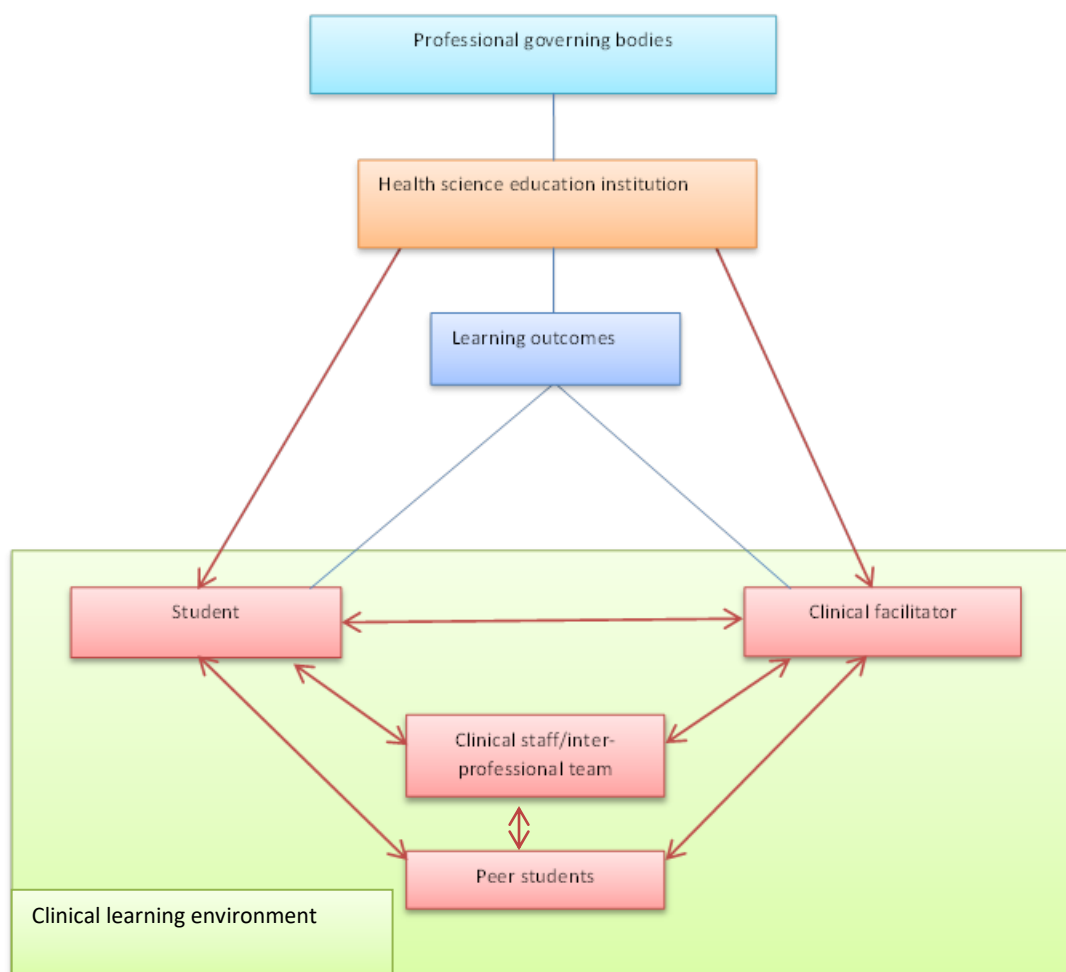


FIGURE 2.4: Conceptual framework of the CLE (adopted from Botma *et al.*, 2013)

Both Hugo and Botma (2019:201) and the Nursing Education Stakeholders Group (NES, 2012:3) identify six major role-players in the clinical education arena (indicated in Figure 2.4). The role-players include: 1) *Students*, who are the key focus of all the activities in the clinical education setting; 2) *Clinical staff*, that includes inter-professional team members and *clinical facilitators* responsible for students' learning; 3) *Peer students*, who support fellow students in the clinical settings; 4) *Clinical settings*, in which scientific learning takes place; 5) *HSEI*, who are responsible for the education programmes, and lastly 6) *Professional governing bodies*, who set the standards for both practice and education. The clinical setting in which health professional students are placed for their WIL is known as the CLE.

2.6 THE CLINICAL LEARNING ENVIRONMENT (CLE)

The CLE is defined as a caring environment where health professional students have the opportunity to integrate theory with practice to create meaningful scientific learning experiences, and provide safe people-centred care while being supported by relevant role-players (Muthathi *et al.*, 2017:1; Jansson & Ene, 2016:17; D'Souza *et al.*, 2015:833). Additionally, the CLE is influenced by the physical space and resources; the nature of the interaction between role-players; the functioning of the clinical setting; student engagement in people-centred care; the organisational ethos, and culture that impacts on health professional students' ability to transfer their learning and reach their learning outcomes (Mansutti *et al.*, 2017:61; Abed *et al.*, 2015:470). The quality of CLEs have been found to have a direct influence on students' satisfaction with their clinical placement, and the success of their future achievements (Lovecchio *et al.*, 2015:254; Chuan & Barnett, 2012:192; Mannix *et al.*, 2009:63).

The CLE consists of different clinical settings. Clinical settings include healthcare environments as found in the community: Primary healthcare clinics; hospitals, including their respective care units, e.g. general wards; emergency; intensive care; mental health, and maternity, to name but a few (Mabuda *et al.*, 2008:20). The HSEI has a responsibility to place health professional students in quality clinical setting for their WIL. They need to control and ensure that the clinical setting offers the

necessary learning opportunities and support for health professional students to meet their learning outcomes (Jacobs, MacKenzie & Botma, 2013:4). Serrano-Gallardo, Martinez-Marcos, Espejo-Matorrales, Arakawa, Magnabosco and Pinto (2016:2) emphasise that the highest possible degree of compatibility between the set learning outcomes and the capacity of a clinical setting to provide learning opportunities is essential for optimal clinical placement.

During the literature overview, the researcher identified and clustered four main aspects which promote a high-quality CLE. These were labelled pillars, as is illustrated in Figure 2.5. The first pillar is described as the atmosphere or ambiance set for health professional student learning, the second pillar reflects the teamwork and collaboration between role-players, the third pillar refers to the workload clinical staff and health professional students experience and the fourth pillar is one of the learning opportunities in the clinical setting. Each pillar will be discussed in detail in the sections to follow.

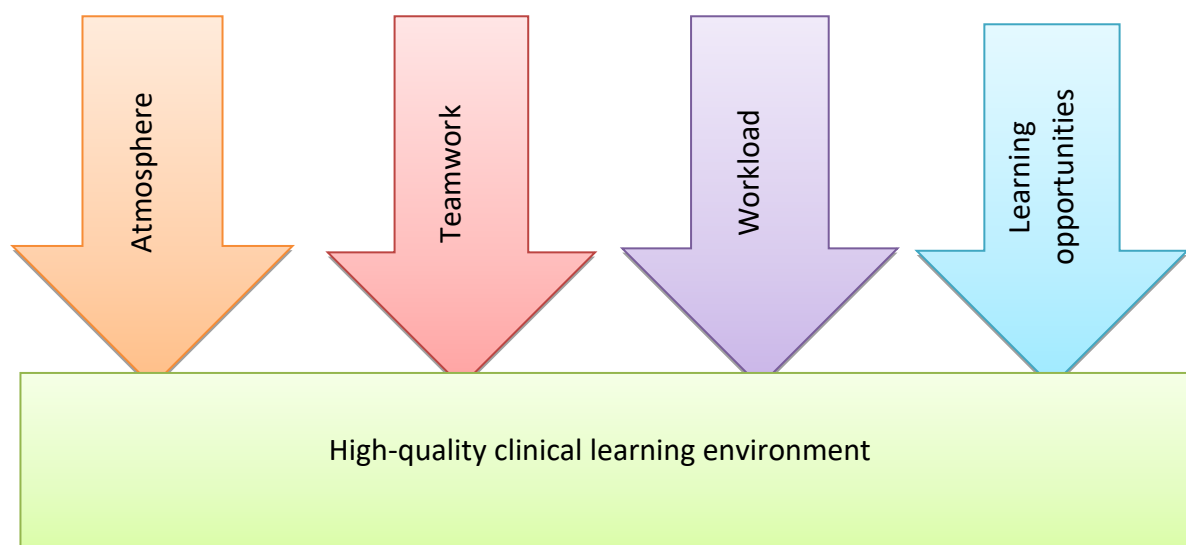


FIGURE 2.5: Four pillars contributing to a high-quality CLE

The clinical settings should provide authentic, high-quality educational experiences that lead to the development of competent health professionals (Hallin & Kiessling, 2016: 141; Anderson *et al.*, 2014:519; Smith, 2012:181). Papastavrou *et al.* (2016:59); Bergjan and Hertel (2013:1393) and Chan (2002:522) point out that not all CLEs are equally suitable for promoting students' clinical competence.

2.6.1 Atmosphere in a clinical setting

The atmosphere in a clinical setting is an aspect that needs careful consideration when evaluating the CLE. There are certain factors about the atmosphere that directly influence health professional students' ability to learn within that CLE. Srimannarayana (2016:264), as well as Botma *et al.* (2013:2) have indicated that the opportunity for health professional students to perform patient care activities in the CLE is dependent on an interrelated relationship between the availability of resources in the work environment; the ambiance set by managers and clinical staff, which creates the transfer climate; the health professional students' characteristics, training design and the support from clinical facilitators used to transfer learning (See Figure 2.6).

The atmosphere in a clinical setting can be illustrated by the transfer climate and the work environment, as illustrated by Donovan and Darcy's (2011) systemic model of transfer of learning. A transfer climate needs character, created by the interaction of people working together, while the working environment includes the availability of necessary resources, consumables and equipment in the clinical setting.

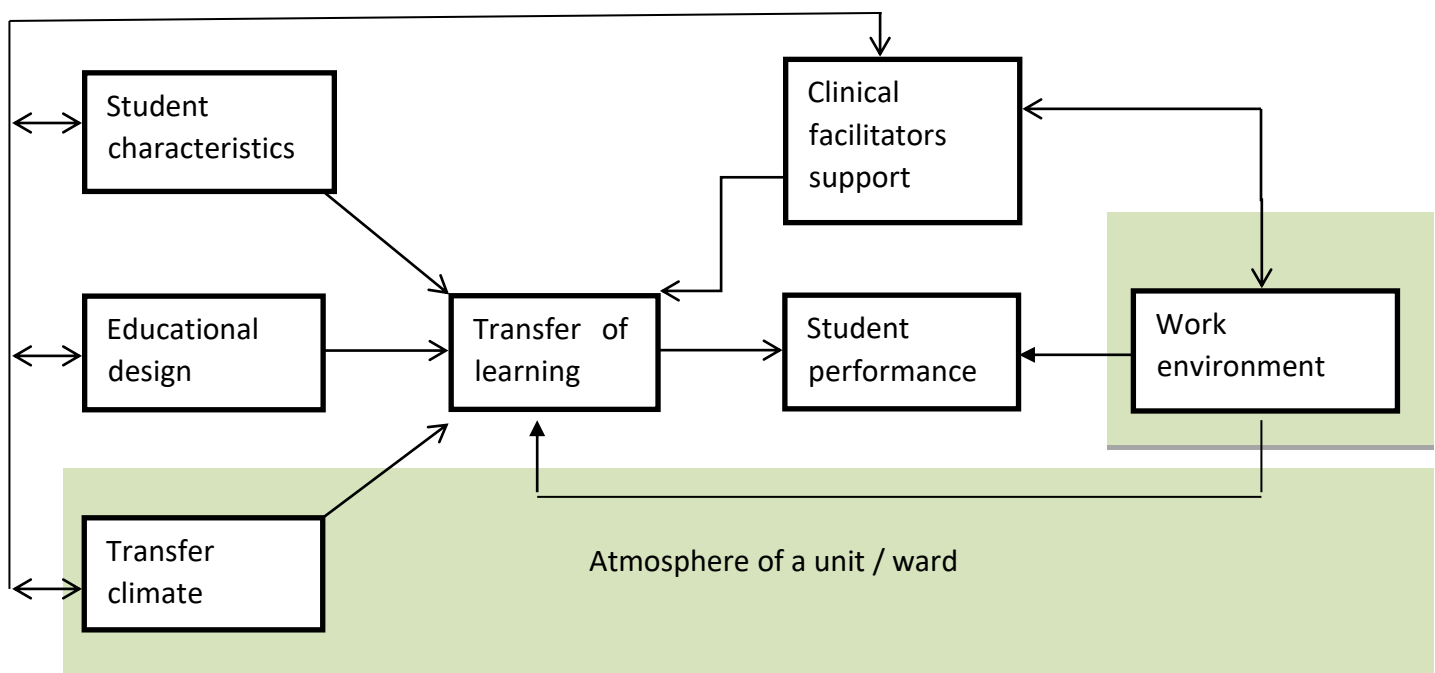


FIGURE 2.6: The systemic model of transfer of learning (adopted and adapted by Botma *et al.*, 2013:2, from Donovan & Darcy, 2011)

Wen and Lin (2014:3) define atmosphere as organisational conditions, or the conditions a person recognises in a working setting which affect that individual's psychological state and performance. The atmosphere in the clinical setting is reflected by the health professional students' opinion of their clinical learning experiences. A clinical setting must appeal to health professional students' satisfaction levels to benefit learning in a well-resourced clinical environment. The perception of health professional students about the level of support received from role-players exhibiting a positive attitude towards their learning needs, and their perception of the level or quality of people-centred care delivered there, enhances an atmosphere (Abed *et al.*, 2015:466; Beukes & Nolte, 2013:306; Mabuda *et al.*, 2008:19). Hence, the atmosphere of a clinical setting is identified as an essential pillar for students to transfer learning.

During WIL, health professional students are placed in clinical settings to meet their expected learning outcomes in a professional work environment. The atmosphere in a clinical setting is instrumental in preparing the student professionally, and aids them in achieving their learning outcomes. A positive atmosphere promotes stronger operational outcomes and increases health professional students' competence (Donovan & Darcy, 2011:123; Srimannarayana, 2016:263). Furthermore, a positive atmosphere also increases health professional students' satisfaction levels with their clinical learning outcomes (Mabuda *et al.*, 2008:20). Satisfied health professional students are motivated to learn, therefore increase their transfer of learning and readily become competent. Interpersonal relationships between role-players are advanced by a positive atmosphere (Kilty, *et al.*, 2017:1; Chuan & Barnett, 2012:192). A well-resourced clinical setting leads to enough human resources to assist the health professional students, and has sufficient well-maintained equipment available for their use to ensure uninterrupted learning (Naidoo, Van Wyk & Adhikari, 2017:2; Botma *et al.*, 2013:43; Kedge & Appleby, 2010:58). Consequently, it is important to note that atmosphere can either promote or impede

the transfer of learning for health professional students in clinical settings (Botma & Mackenzie, 2016:105).

One of the factors identified as a key contributor to atmosphere is organisational ambience.

2.6.1.1 *Organisational ambience*

To contribute towards a positive atmosphere, a clinical setting's organisational quality should be favourable towards health professional students and learning (Papastavrou *et al.*, 2016:177). Organisational ambience refers to physical and human resources, and an organised clinical setting.

2.6.1.1.1 *Physical resources*

As contributors towards a favourable atmosphere, the quality and function of physical resources in clinical settings should never be overlooked. Physical resources include the infrastructure of buildings; their maintenance and security levels; the availability of supplies and consumables to perform tasks; and the accessibility and maintenance of the equipment used in the clinical setting. Atakro and Gross, (2016:1) and Chuan & Barnett (2012:196) agree that students find a clinical setting's atmosphere more positive when having sufficient, functional equipment, and enough supplies and consumables to perform their daily duties.

Countries contending with inadequate physical resources and financial strain in clinical settings highlight several challenges for students and clinical staff (Bvumbwe, Malema & Chipeta, 2015:1; Msiska *et al.*, 2014:35). In Malawi, a lack of equipment and supplies implies that healthcare professionals often need to improvise to perform healthcare procedures, which can compromise the safety of patients (Msiska *et al.*, 2014:35). In South Africa, the story is no different. South African studies identified that shortages of essential equipment and supplies; poor hygiene in clinical settings; limited physical space; poor infrastructural support and bad maintenance of buildings affects the learning outcomes of health professional

students negatively (Naidoo *et al.*, 2017:236; Botma & Mackenzie, 2016:108; Lekalakala-Mokgele & Caka, 2015:2). Intended learning outcomes would not be reached during clinical placements, which leave the health professional student with a sense of failure. Health professional students become frustrated with their environment if there is a lack of equipment which means they cannot apply what they have learned in class (Botma & Mackenzie, 2016:108; Lekalakala-Mokgele & Caka, 2015:2). This can cause learning confusion. Lack of equipment can also lead to health professional students taking shortcuts that might compromise patient care and patient safety (Msiska *et al.*, 2014:37). These factors may leave health professional students unmotivated with the training programme and consequently decrease their transfer of learning. Aktas and Karabulut (2016:128) state that such physical environments are not conducive to health professional students' learning in CLEs, and need to be improved.

The quality and capability of organisations' human resources also affect the atmosphere in a clinical setting.

2.6.1.1.2 *Human resources*

Human resources refer to the number of skilled role-players available to provide patient care while supporting health professional student learning and increasing their levels of competence. In South Africa, clinical settings are often understaffed (Botma & Mackenzie, 2016:108; Gaede & Versteeg, 2011:99). As patient care is clinical staffs' primary responsibility, support for student learning and achievement of learning outcomes are directly compromised when clinical settings are understaffed (Naidoo *et al.*, 2017:236; Lekalakala-Mokgele & Caka, 2015:2). To address staff shortages in clinical settings, researchers advise HSEIs to assist the clinical settings in supporting their health professional students (Hugo & Botma, 2019:195; Cloete & Jeggels, 2014:1). Clinical facilitators should be appointed by the HSEIs to support health professional students' learning while placed in clinical settings. In Canada, O'Mara, McDonald, Gillespie, Brown and Miles (2014:2013) identified that the main challenge in the CLE was mostly the lack of expert human resources with knowledge on how to transfer learning, available to support students in the clinical

setting. In South-Africa the situation is similar to that in Canada. Due to clinical staff shortages, there is less expert and experienced clinical support staff available. Those that are available are often not equipped with the necessary educational skills, knowledge and attitude to accompany and aid students in the clinical settings (Hugo & Botma, 2019:195). Therefore, health professional students are left unsupported and their expected clinical learning outcomes are not achieved (Lethale, Makhado & Koen, 2019:19).

Achievement of specific learning outcomes during students' WIL enhances their satisfaction with the atmosphere of the clinical setting (Naidoo *et al.*, 2017:2). As indicated, the number of clinical staff able to render people-centred care and assist in student learning is important for health professional students to achieve their learning outcomes. Achieving learning outcomes also relies on the educational and clinical competence levels of the clinical staff that assist the health professional students. Health science education institutions should be mindful of the availability of physical and human resources when placing their students for WIL.

A further contribution to the organisational ambiance is found in the level of organisation in a clinical setting.

2.6.1.1.3 *Well-organised clinical setting*

A well-organised clinical placement sets the tone for health professional students' scientific experience and contributes to the atmosphere in the clinical setting (Hooven, 2015:427). Health professional students feel more satisfied with their clinical placement if they are well-received in the unit (Botma & Mackenzie 2016:108; Chuan & Barnett, 2012:193). A well-organised environment receives communication from the HSEI before the health professional students' arrival. This communication should include the number and names of the expected students; the time frame of the placement and the expectations from students and clinical staff during this period (Birks *et al.*, 2017:16; Jansson & Ene, 2016:18). Good collaboration between role-players ensures clarification of expected learning outcomes to be obtained during clinical placement.

Good organisation starts with being familiar with the layout of clinical settings, which must be clear and make sense to the students.

2.6.1.2 *Familiarity with the clinical setting*

A welcoming experience in the clinical environment is promoted when staff expects the students, greet them politely at the entrance, and introduce other team members to them (Botma & Mackenzie, 2016:108; Chuan & Barnett, 2012:192). This creates a feeling of familiarity between the health professional student, clinical staff and physical setting. Students, who have a sense of belonging to the new environment and the clinical team, feel an increase in motivation to transfer learning. A further welcoming gesture is to orientate the health professional students to the unit.

2.6.1.2.1 *Orientation of health professional students*

Orientation is a process of introducing health professional students to their new CLE. Basic familiarisation with the unit through orientation increases students' sense of belonging and motivation, while developing their self-confidence in the new environment (Sercekus & Baskale, 2016:135). Charleston, Hayman-White, Ryan and Happell (2007:29) state that orientation is needed to support new health professional students in the process of integrating theory into practice, while assisting students with the transition from HSEI-life, to working in a clinical setting. Orientation should familiarise students with the clinical work environment, e.g. where to find what; the routine of an average day; all documentation expected from them, as well as what the expectations regarding students' performance of clinical activities would be (Arpanantikul & Pratoomwan, 2017:130). Well-orientated students are confident and could contribute to delivery of a higher level of people-centred care (Eastland, Morrow & Davis, 2018:1491; Lindfors & Junttila, 2014:2). Ultimately, orientation increases health professional students' sense of satisfaction during their clinical learning experience, and contributes to the feeling of fitting right in. The acceptance of clinical staff to taking time to welcome and orientate them, builds relationships with other professionals (Mannix *et al.*, 2009:61). Botma and Mackenzie (2016:108) and Sercekus and Baskale (2016:137) concur that familiarisation with the clinical unit; awareness of learning outcomes; meaningful interpersonal relationships between role-players and health professional students; positive interaction, and the level of support and assistance provided to students is

essential in the learning atmosphere, and therefore contributes to a high-quality CLE.

2.6.1.3 *Meaningful interpersonal relationships*

Interpersonal relationships refer to a strong association between individuals working together in the same work environment. Clinical staff working side-by-side in a work environment needs one other for support in providing quality patient-centred care. Meaningful interpersonal relationships are built on mutual trust and respect between role-players (Lee & Doran, 2017:75). This includes clinical staff respecting health professional students, and seeing them as part of the team that has something positive to contribute to patient care.

Furthermore, friendly and approachable clinical staff promotes health professional students' communication skills. In an accepting environment, students feel safer participating in discussions to promote people-centred care, or when requesting and using learning opportunities to refine their clinical skills (Sercekus & Baskale, 2016:137; Hooven, 2015:427). Approachable clinical staff contributes to and support students in their transition into health professionals (Thomson *et al.*, 2017:520). Appropriate and respectful behaviour, mutual trust and social interaction have a positive impact on student learning, behaviour and growth, while adding to the positive clinical learning experience and unity between healthcare colleagues (Kilty *et al.*, 2017:227; Dadgaran, Shirazi, Mohammadi & Ravari, 2016:127; Dimitriadou *et al.*, 2015:236; Hooven, 2014:316). Positive relationships between health professional students and clinical staff are seen as a strong influential factor in the development of a constructive attitude toward clinical learning (D'Souza *et al.*, 2015:833; Chuan & Barnett, 2012:193).

On the other hand, students displaying positive attitudes allow professional staff to feel that they can trust their undergraduates with responsibilities in the clinical setting, creating a culture of willingness to help (Sercekus & Baskale, 2016:134; Hooven, 2015:421; Chuan & Barnett, 2012:193). Accountable health professional students develop a sense of independence much sooner (Shivers, Hasson & Slater,

2017:58). The atmosphere of a clinical setting also improves when clinical staff displays professional engagement during people-centred care.

The implementation and inclusion of innovative ideas to aid health professional students' learning should be part of the people-centred care and considerations of clinical staff.

2.6.1.4 *Innovative ideas*

Research has shown that innovation towards clinical learning and a variety of student activities in the clinical setting clearly contributes to a positive atmosphere (Chan, 2002:518). Health professional students experience a positive learning atmosphere when a variety of interesting patient cases is part of their daily clinical routine. On the other hand, they experience the atmosphere negatively if allocated to do the same clinical tasks every day, or are only allowed to do routine activities regarding patient care (Serrano-Gallardo *et al.*, 2016:2). Routine tasks and repetition of the same tasks cause students to feel stuck in their learning (Henderson *et al.*, 2012:299). Health professional students want and need innovation and variety in their clinical day (Philips *et al.*, 2017:212). During the health professional student placement, they need and want to apply their classroom theory to make learning fresh and more meaningful. Health science professionals need to be encouraged to share their own practical and advanced ideas regarding patient care with their students.

Various teaching strategies can be used to develop innovative ideas in the clinical setting. Applying different teaching approaches encourages health professional students to be active learners, and increases students' satisfaction with their clinical learning experiences (Botma *et al.*, 2013:34). Health professional students can be involved in discussions on patient care, for example during report handovers, or in preparing posters and pamphlets on illness to be presented to the clinical staff and their peers on duty. These are but a few examples that contribute to actively engaging students in their own learning (Botma & Mackenzie, 2016:105). Papastavrou *et al.* (2010:177) and Thomson *et al.* (2017:514) indicate that clinical

facilitators are crucial in creating activities and exercises for learners where they can integrate their learning and become professionals. Thus the combination of encouraging innovation and providing variety in a health professional student's clinical day contributes to students' satisfaction and a positive clinical atmosphere, which is further enhanced when good quality people-centred care is seen to be delivered.

2.6.1.5 *Good quality people-centred care*

As previously described, and concurred by Nepal *et al.* (2016:181), delivering quality people-centred care to the healthcare consumer is a key element in developing a positive atmosphere that supports student progression. Health professional students should be given a voice in discussions on patient care (Sercekus & Baskale, 2016:134), e.g. informing the clinical staff on the 1) progress of patient care; 2) specific plan(s) for care; 3) intended actions to be implemented or which have been implemented, and 4) evaluation of actions which improved the outcome of a patient, or not (Hooven, 2015:421). Aktas and Karabulut (2016:124) state that students' motivation to learn increases as the quality of people-centred care around them improves.

In summary, the atmosphere of the clinical setting plays an important role in a CLE. Organisational ambiance sets the tone of the atmosphere, while aspects of the organisation, such as the availability and quality of an organisation's physical and human resources, are important to how health professional students perceive the CLE. Health professional students are more satisfied with their clinical placement if the organisation is well-administrated; they had initially been familiarised with their new environment, and have received further orientation. Meaningful interpersonal relationships are fostered and valued by health professional students. Students furthermore identify a clinical setting's atmosphere as positive when they can participate and be innovative during patient care, and if good quality people-centred care is delivered. Should the mentioned factors not be taken into consideration or be in place, however, a CLE can be labelled as having a negative atmosphere.

2.6.1.6 *Negative atmospheres*

Negative atmospheres are created when the focus in the clinical setting is on only getting the job done and no consideration is given to health professional students' needs (Naidoo *et al.*, 2017:8; Lekalakala-Mokgele & Caka, 2015:1). Dimitriadou *et al.* (2015:240) highlights that interpersonal relationships often fail due to a high clinical pace; cultural differences; inadequate resources; poor communication; and if unsupportive clinical facilitators are treated as service providers and not as an integral part of the training team. Additionally, interpersonal relationships can fail due to unfriendly staff with negative attitudes; unethical behaviour, or lack of respect and trust among healthcare professionals (Dimitriadou *et al.*, 2015:240; Palese, Dante & Tonzar, 2014:218; Chuan & Barnett, 2012:196). Aktas and Karabulut (2016:128); Hakojarvi, Salminen and Suhonen (2014:138) and Papastavrou *et al.* (2010:178) all identified that poor interpersonal dealings or autocratic, hierarchical relationships and bullying obstruct a student's transfer of learning, and consequently creates a negative atmosphere in the CLE.

2.6.1.7 *Bullying in clinical settings*

Unity among healthcare professionals can be irreparably harmed if clinical staff neglects their leadership and educational roles in the clinical setting (Sundler *et al.*, 2014:661; Papastavrou *et al.* 2010:177). Botma and Mackenzie (2016:104) identified that when clinical staffs such as nursing managers demonstrate a lack of strong leadership it could lead to confusion among role-players. Clinical role-players unclear about their own function(s) with regard to health professional students' learning may experience personal uncertainty and a lack of sufficient preparation time to efficiently support students, leading to the development of a negative attitude-culture towards students. Poor leadership can contribute to healthcare professionals' adverse feelings about extra responsibilities in an environment already loaded with a high and complex clinical workload (Chuan & Barnett, 2012:193). These negative relationships can contribute to bullying of 'soft-target' health professional students.

Reported bullying is increasingly reported in literature (Engelbrecht, Heyns & Coetzee, 2017:8493) and remains a big problem in many clinical settings (Meyer, Van Schalkwyk & Prakaschandra, 2016:62; Smith *et al.*, 2016:506; Weller, Boyd & Cumin, 2014:150). Bullying is defined as negative, unwanted acts aimed at other people (Smith *et al.*, 2016:506). The intensity and type of bullying may vary. Rajeswaran (2016:3) reported that health professional students currently perceive bullying at a high intensity level due to their unfamiliarity with the clinical environment. The most common forms of reported bullying include verbal and nonverbal behaviours such as undervaluing; negative and sarcastic remarks; having unreasonable expectations; hostile or degrading behaviour; being ignored or socially isolated, and being shouted at or threatened in the clinical setting (Smith *et al.*, 2016:506).

Health professional students experience their role in the CLE as one of inferiority. Lekalakala-Mokgele and Caka (2015:6), and Mabuda *et al.* (2008:24) confirm that health professional students in South Africa often experience feelings of stress due to being called names; harassment; alienation, and being ignored or disrespected. In many instances, students are used as "scapegoats for wrong-doings" (Mabuda, *et al.* 2008:24).

Koh (2016:218) places the effects of bullying of health professional students on four levels: Firstly on a physical impact level; then an emotional impact level; an organisational impact level, or on the patient care level. When the victim of bullying is affected on a physical or emotional level, it directly disrupts the clinical setting and indirectly spills over into the level of people-centred care. Bullying may cause physical complaints such as headache or feelings of depression (Koh, 2016:219). Consequently, it may lead to an increase in absenteeism, and contribute to staff shortages at an organisational level (Nielsen, Indregard, Krane & Knardahl, 2019:1; Koh, 2016:213). Patient safety may be at risk as well, if the quality of care is compromised due to health professional students' physical and emotional upheaval (Koh, 2016:218). Bullying always affects the atmosphere of a CLE negatively.

If focusing on the effect of a bullying environment on student learning, it becomes clear that bullied health professional students' level of satisfaction with their clinical placement would sharply decrease, which in turn directly influences their attitude and motivation to learn. When health professional students are demotivated, it can be almost certain that less transfer of learning will take place, compromising their clinical and professional competence (Donovan & Darcy, 2011:239). This is another reason why a positive atmosphere is such an essential aspect of a CLE. Yun, Kang, Lee and Yi (2014:219) found that less bullying is usually experienced in a workplace where a positive atmosphere is cultivated.

Scotti and Harmon (2014:420), and Chuan and Barnett (2012:192) emphasise that the CLE will be further enhanced if there is a positive team spirit and teamwork among the healthcare professionals.

2.6.2 Teamwork in the clinical setting

Teamwork provides health professional students with opportunities to learn by observing other team members performing people-centred care, or during feedback by team members (Naidoo *et al.*, 2017:2; Lekalakala-Mokgele & Caka, 2015:3; Chuan & Barnett, 2012:193). Studies by the World Health Organisation (2012:1) have confirmed that teamwork has an immediate and positive impact on people-centred care. In complex clinical environments, teamwork is also effective in addressing shortages of healthcare professionals (WHO, 2012:1). Effective teamwork in clinical settings has become very important in changing healthcare systems. It has been shown that quality care and patient safety increases along with an improvement in the occupational ambiance when healthcare professionals work and learn together (Morphet *et al.*, 2014:198; Weller *et al.*, 2014:153).

2.6.2.1 *Characteristics of a healthcare professional team*

Babiker *et al.* (2014:3) and the WHO (2012:1) define “team” as a unique set of two or more healthcare professionals who work collaboratively, interdependently and adaptively to accomplish shared goals in clinical settings. A healthcare team may include 1) role-players from a single healthcare profession, or 2) inter-professionals with the common goal of people-centred care. Both these types of teams can function in a clinical environment where students are placed for work integrated learning. An inter-professional healthcare team could include many professions such as medical practitioners; nurses; dietitians; physiotherapists and any other healthcare professionals focused on people-centred care. Inter-professional education takes place when two or more professions learn together with, from and about each other, to improve collaboration and the quality of the centred care they ultimately aim to provide (WHO, 2013:9). The other form of teamwork takes place between two or more practitioners from a single healthcare profession, when persons with different specialities in the same profession collaborate to promote people-centred care, for example nurses. In the literature review for this study, teamwork between peer students was also indicated as an aspect of importance in the CLE (Donia, O'Neill & Brutus, 2018:87; Chuan & Barnett, 2012:193).

An effective team interacts dynamically with each other to achieve a common goal. The WHO states that team members should have specific attributes to be effective (WHO, 2012:2). They need to understand their roles and responsibilities, as well as the roles and responsibilities of other healthcare professionals; communicate effectively with one another; share their expertise and act as a collective unit during patient care (Babiker *et al.*, 2014:11; Morphet *et al.*, 2014:197; WHO, 2012:5). Rosen *et al.*, 2018:433 and the WHO (2012:3) furthermore indicated that teamwork benefits a clinical setting's atmosphere, service delivery and student dynamics, as well as improving health outcomes and promoting the quality of care. Anderson *et al.* (2014:518) and Babiker *et al.* (2014:3) state that when teamwork is compromised, the result is a high risk of poor quality patient care and a drop in the quality of health professional students' learning experiences.

In a clinical setting, teamwork can be divided into three categories described as influencing a positive CLE (see Figure 2.7). The first category refers to teamwork between role-players in the clinical environment; the second is teamwork between inter-professional teams, while the last category refers to teamwork between peer students, all of them equally important.

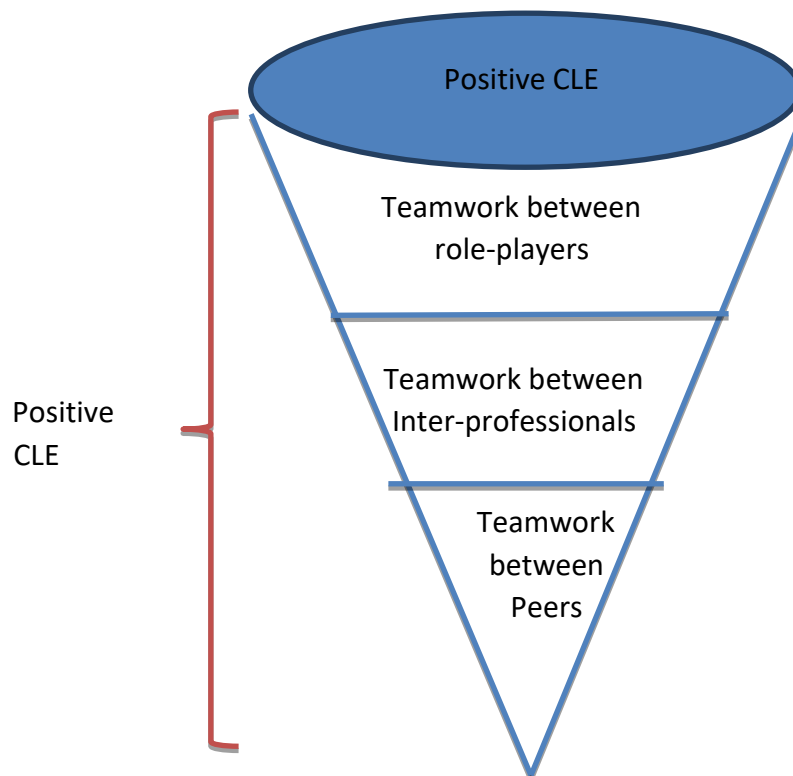


FIGURE 2.7: Categories of teamwork that form part of a positive CLE.

Each category will be described in more detail in the following sections.

2.6.2.2 Teamwork between role-players

As mentioned, educators and clinical facilitators from HSEIs are responsible for communicating and collaborating with staff from the clinical settings to clarify learning objectives and schedule student placements. Literature strongly suggests that the collaboration and teamwork between the HSEI educators and the clinical staff is a crucial ingredient in the success of health professional students' clinical experiences (Hooven, 2014:316). Good communication ensures that all role-players understand what a health professional student needs to do during a clinical

placement (Baraz, Memariam & Vanaki, 2015:6). Effective communication furthermore limits time delays for health professional students to start performing practical skills. In previous studies, health professional students verbalised that being part of the healthcare team made it easier for them to communicate directly about skills' training and their learning outcomes (Muthathi *et al.*, 2017:7; Phuma-Ngaiyaye *et al.*, 2017:164; Hooven, 2015:424; Mabuda *et al.*, 2008:2). As discussed, health professional students who feel they are part of the healthcare team are much more likely to share their thoughts; participate in decision-making and ask questions to fill gaps in their education (Morphet *et al.*, 2014:204). Collaboration helps health professional students gain confidence and competence, as well as increases understanding of the importance of effective cooperation and team communication.

Another form of teamwork that plays an important role in the CLE is inter-professional teamwork, an unique attribute of various healthcare professions.

2.6.2.3 *Inter-professional learning*

Inter-professional clinical placements provide essential experiences for theory-practical integrated learning (Talwalkar *et al.*, 2016:144; Morphet *et al.*, 2014:197). Health professional students need to know that learning from and about other professions by way of shared knowledge exchanges are important (WHO, 2010:24). Knowledge exchanged as part of an inter-professional team often takes place during clinical rounds or clinical team meetings. Healthcare professionals need to pay special attention to each other in order to divide professional tasks for the benefit and safety of patients. Health professional students participating in inter-professional training activities learn to respect one another's roles and be accountable for their own actions and responsibilities. Unity between healthcare professionals helps to create safe environments where health professional students can learn, test their new skills and execute learning outcomes set by HSEIs (Phillips *et al.*, 2017:206; Anderson *et al.*, 2014:518; Morphet *et al.*, 2014:198; Palese *et al.*, 2014:2018). In the CLE, unity between healthcare professionals supervising

students' work is viewed as one of the strengths of teamwork (Pacifico *et al.*, 2018:2; Anderson *et al.*, 2014:519; Chuan & Barnett, 2012:193).

Additionally, inter-professional learning provides opportunities for different professions to share their knowledge and expertise, and enable health professional students from various disciplines to better understand patient interventions (Anderson *et al.*, 2014:518; Morphet *et al.*, 2014:197). Health professional students can learn to perform skills from other team members, but also to realise the limitations of their and other professions, such as the limits in a legal scope of practice places on various practitioners. Health Science Education Institutions who provide inter-professional student placements find that this practice has the benefit of increasing students' sense of autonomy and responsibility by effectively allowing them to rehearse their future professional roles (Naidoo *et al.*, 2017:2; Morphet *et al.*, 2014:202). Inter-professional learning can thus contribute to a health professional student's sense of satisfaction and professional growth (Chen *et al.*, 2016:30).

Interaction between peer students contributes to teamwork, and is valued as a major contributor to students' experiential learning.

2.6.2.4 *Teamwork between peer students*

The value of peer student collaboration can often be overlooked during clinical placement. Various studies identified the important influence of peer students as a clinical learning factor. Brynildsen, Bjork, Berntsen and Hestetun (2014:727) and Botma *et al.* (2013:808) define peer support as a collaboration between undergraduates from the same educational programme, or similar / different year levels, for example first-year and third-year nursing students. In a CLE, peer learning has a potential for supportive, creative and innovative learning opportunities (Brynildsen *et al.*, 2014:727). Peers helping, guiding and instructing each other on "the way to do things around here" creates the opportunity for more experienced health professional students to act as immediate, accessible consultative resources for those with less or no experience in the CLE (Brynildsen *et al.*, 2014:727; Botma

et al., 2013:808; Chuan & Barnett, 2012:193). Networking allows health professional students to share and learn from each other's experiences, knowledge and skills; discuss practices; work together, and to ease the process of requesting help when uncertain (Brynildsen *et al.*, 2014:723; Chuan & Barnett, 2012:193). Interpersonal relationships between health professional students are important in clinical learning, while a lack of peer support often leads to conflict and competition for learning opportunities (Chuan & Barnett, 2012:196). Health professional students usually indicate a pronounced sense of satisfaction when they are placed with other health professional students for WIL (Brynildsen *et al.*, 2014:727; Sercekus & Baskale, 2016:136). However, it is important to note that peer learning cannot replace CLE supervision or expert facilitation (Brynildsen *et al.*, 2014:727; Henderson & Newton, 2010:3587).

Finally, the workload in CLEs can directly be influenced by the outcome of teamwork and support from peers.

2.6.3 Workload in the clinical setting

The workload in the CLE is influenced by the level of healthcare delivered to patients and the required clinical learning outcomes of students. The workload of clinical staff not only directly affects the quality and level of healthcare delivered to patients, but also the time and amount of support that will be rendered to health professional students in the CLE. Literature overview(s) have furthermore indicated that the health professional student workload in the CLE impacts on their learning transfer and clinical competencies. A review of the workloads of clinical staff and students for this study has heightened the researcher's view of how important this contributing factor in the CLE really is.

2.6.3.1 *Clinical staff workload during clinical learning*

Although people-centred care should be the main priority of clinical settings (Hooven 2015:422), the level of healthcare delivered to patients differs between clinical settings. In hospital environments the acuity level of patients' conditions plays an

important role in the workload of healthcare professionals, while the patient turnover is significant in a clinic setup. Clinical learning environments that are extremely busy leave health professional students feeling unwelcome, confused and often with the sense that they do not belong there (Botma & Mackenzie, 2016:107; Mokgele & Caka, 2015:2). Health professional students can feel overwhelmed in high turnover CLEs that are busy, overcrowded and time-pressured (Kilty *et al.* 2017:1; Msiska *et al.* 2014:36; Bergjan & Hertel, 2013:1394). As people-centred care remains the main focus of clinical staff, it may be difficult to find time or sufficient energy for student training (Mabuda *et al.*, 2008:20). Clinical staff shortages can leave frustrated, overworked professionals unable to cope with their training responsibilities (Hooven, 2015:422; Hooven, 2014:316), which subsequently affects staff attitudes towards health professional students. Students are frequently seen as outsiders, and not the main service priority, as they contribute to the overall workload of clinical staff. This alienating attitude has a direct impact on students' ability and motivation to reach CLE learning outcomes (Sercekus & Baskale, 2016:137; Meyer *et al.*, 2016:61). Support for student learning would therefore always be limited and compromised when clinical staff experiences an increase in patient-associated workloads.

The extent of students' workload during their experiential learning is a further complicating aspect in a CLE.

2.6.3.2 *Workload of health professional students during clinical learning*

Health professional students play a dual role in any clinical setting. Firstly, they are student who needs to gain competence by completing pre-set learning outcomes in specific CLEs. Their second role is to be part of the workforce, attending and actively participating in the delivery of people-centred care (Shivers *et al.*, 2017:59). The dual roles of students place a huge responsibility on the other role-players in the CLE, and on the students themselves. To balance these diverse roles influences the health professional students' workload significantly.

The role of being a part of the workforce in a clinical setting creates the sense of belonging in students, providing them with the opportunity to take care of patients. Health professional students also have the opportunity to learn; observe the skills of their role-models, and interact professionally with patients and the clinical staff (Anderson *et al.*, 2014:519). To prevent or reverse negative experiences, they need recognition; adequate preparation and support from the professional team to stimulate their self-confidence and dependability. Liu, Gu, Wong, Luo & Chan, (2015:131) and Serrano-Gellardo *et al.*, (2015:7) explain that if health professional students are inadequately prepared to take care of patients, they would learn to fear making mistakes; feel overwhelmed by all the responsibility, and develop a lack of confidence.

Health professional students experience the CLE negatively when their clinical responsibility is more than routinely expected from them (Liu *et al.*, 2015:129). Liu *et al.* (2015:129) identified a weighted curriculum with many assignments, and completion of a large number of required clinical hours as two factors that contribute to students' workload in the clinical environment. To support student-centred learning, students should be allowed to negotiate their workload in the clinical setting.

Apart from the atmosphere, the teamwork and the workload, the diversity of learning opportunities offered in the CLE is also very important to reach professional competence.

2.6.4 Learning opportunities in the clinical setting

The availability of various learning opportunities for health professional students while placed in the clinical setting contributes to a positive CLE. The expected learning outcomes should correspond to the available CLE learning opportunities. Health professional student engagement during learning activities is an important factor in utilising training occasions. Achieving all or most of the essential learning outcomes during a clinical placement is important for a student's satisfaction with a CLE. Hugo *et al.* (2018:84) indicate that some students need more effective

guidance and support from supervisors and clinical facilitators in pursuing / mastering learning outcomes in the CLE than others.

Support for health professional students in a CLE can refer to systems support or cognitive and emotional support during their clinical rotation. The opportunity for health professional students to work with authentic patients in a clinical setting is a huge contributing factor towards the success of CLEs. In order to measure students' efficiency and competence, they must be clinically assessed in the appropriate setting, and provided with relevant feedback. Botma and MacKenzie, (2016:108), and Chuan and Barnett, (2012:193) agree that the successful application of available learning opportunities is dependent on a student's attitude towards his placement in the CLE.

Health professional students' attitude plays an important role in how they will approach their placement and learning opportunities. Those with a more positive attitude towards their clinical placement would exhibit emotions of excitement (Chuan & Barnett, 2012:192), which increases their motivation to learn, and subsequently promotes their clinical and professional performance (Hooven, 2015:421). These health professional students will also be motivated to look for more learning opportunities during their clinical placement.

2.6.4.1 *Learning opportunities vs learning outcomes*

Health Science Education Institutions need to pursue clinical settings with multiple learning opportunities, where health professional students can integrate diverse theories and practices. One of the roles of HSEIs is generating learning outcomes to integrate theory-practice in obtaining clinical competence (Sercekus & Baskale, 2016:134). It is important that learning outcomes are realistic and achievable for the specific placement. A positive CLE is seen as an environment that provides a link between learning outcomes and the clinical learning opportunities (Serrano-Gallardo *et al.*, 2016:2). Expected learning outcomes must correspond to the available learning opportunities for students to transition in their clinical learning (Muthathi *et al.*, 2017:1; Mabuda *et al.*, 2008:2).

Students should be theoretically prepared prior to allocation to prevent a mismatch between what was taught in class and what they will experience during clinical placement (Chuan & Barnett, 2012:193). Mismatches cause confusion in students; hinders integration between theory and practice, and decreases health professional students' levels of competence (Phillips *et al.*, 2017:205). Learning confusion is exacerbated if students do not know what will be expected of them before being placed in a clinical setting.

2.6.4.2 *Student engagement*

As discussed, health professional students should be clear on what to expect in the clinical setting and which learning opportunities and outcomes could be achieved during their placement in specific environments. Clinical facilitators and staff should allow students to work at their own pace and accommodate their various learning styles (Jeppesen, Christiansen & Frederiksen, 2017:112). Furthermore, students should be encouraged to become self-sufficient and self-directed by taking more active roles during engagement sessions like clinical rounds (Van Lankveld *et al.*, 2019:2; Serrano-Gallardo *et al.*, 2016:2).

Self-directed learning is defined as a process in which a student takes initiative, with or without the support of others, for identifying their own educational needs; formulating goals; identifying learning resources; choosing and implementing appropriate training strategies, and evaluating learning outcomes (Van Lankveld *et al.*, 2019:2; Brookfield, 1994:online). The act of self-directed learning is a process that helps a health professional student transfer learning in the process of becoming a life-long learner. It has been noted that when health professional students are allowed to work at their own pace and become self-directed, their satisfaction with clinical learning improves (Mansutti *et al.*, 2017:60).

Students' active engagement is one of the factors that influences their ability to achieve their desired learning outcomes (Mansutti *et al.*, 2017:61), although the CLE does influence health professional students' approach to learning and the quality of their completed learning outcomes (Naidoo *et al.*, 2017:2). The successful use of learning opportunities depends on students' engagement with their clinical learning.

Although health professional students are responsible for their own clinical learning, HSEIs remain accountable for ensuring that opportunities are available to transfer learning.

2.6.4.3 *Availability of essential learning opportunities*

An aspect to consider when examining students' learning prospects is the availability of sufficient learning opportunities (Saarikoski, Warne, Kaila & Leino-Kilpi, 2009:595). There should be enough potential learning occasions available for the number of health professional students placed in the unit, including the number of inter-professional students (Govina *et al.*, 2017:241). Students experience CLEs negatively when they need to compete with numerous other health professional students to reach their learning outcomes, for example if nursing and medical students in the maternity units have to compete with each other, waiting for an opportunity to deliver their set number of babies (Chuan & Barnett, 2012:192). When there are more health professional students than learning opportunities, the risk of negative competition increases, and students turn pessimistic about their learning experiences, or the CLE (Sethi & Khan, 2018:359; Phillips *et al.*, 2017:205).

In the same context, HSEIs should also consider that the optimal use of available learning opportunities is dependent on the volume of skilled guidance and support health professional students will receive.

2.6.4.4 *Guidance and support*

Clinical staff and clinical facilitators need to guide and involve health professional students in identifying potential learning opportunities. Different groups' clinical learning outcomes should be clear to the clinical staff and their clinical facilitators. Sadly, learning outcomes are often not met if clinical staff and facilitators are unsure what the expected learning outcomes are, or what all the goals are that students need to achieve (Botma & Mackenzie, 2016:109; Chuan & Barnett, 2012:193; Mabuda *et al.*, 2008:19). In a supportive CLE, health professional students are guided by clinical staff and facilitators towards appropriate learning opportunities by informing them of upcoming tasks, and encouraging them to optimise their opportunities (Hooven, 2015:421). The nature of the support and interaction between students and clinical staff or facilitators contributes to students' successful training (Phuma-Ngaiyaye *et al.*, 2017:164; Naidoo *et al.* 2017:1). Being directed

towards learning opportunities often makes health professional students realise that they lack basic knowledge, the skill or experience to meet their learning requirements (Chan, 2002:517; D' Souza *et al.*, 2015:833). Supporting students when performing a clinical task, is one more way for them to become independent professionals (Meyer, Naude, Shangase, & van Niekerk., 2009:83). Effective clinical learning requires that students be involved in the tasks at hand, but act under direct supervision (Flott & Linden, 2015:501).

Their guidance should include practical demonstrations; coaching; role modelling on how to do a task; case presentations; mind mapping, and brainstorming to develop problem-solving and critical thinking skills, followed by performing tasks under supervision until competency is reached (Jansson & Ene, 2016:17; Meyer *et al.*, 2009:84). With the correct guidance, health professional students' new skills increase, and they could be allowed to work more independently (Chuan & Barnett, 2012:193). Independence means gaining self-confidence while performing clinical skills and optimising clinical learning (D'Souza *et al.*, 2015:833; Chuan & Barnett, 2012:192). Supportive supervisors are important, empowering a student to build self-confidence and skill (Sercekus & Baskale, 2016:135).

In this study, everyone overseeing student learning was viewed as a supervisor. An important characteristic of a supervisor is to be a good role-model for students (Anderson *et al.*, 2014:518; Meyer *et al.*, 2009:91). Health professional students will copy attitude, behaviour and clinical performance from their supervisors, because that is the example that is set. Health professional students assume that this is how a role is to be fulfilled when they are the professionals themselves (Botma & Mackenzie, 2016:107).

Hugo *et al.* (2018:83) identified the three types of support that students actively need in the CLE, including systems support, along with cognitive and emotional support.

2.6.4.4.1 Systems support

Systems support refers to collaboration and communication between the HSEI and supervisors in the clinical setting. As discussed, Jansson and Ene (2016:17) also concur that success in the supervision of students depends on the organisation's ability to create a supportive environment for health professional students. Supervisors must be familiar with the curriculum and the expected learning outcomes to effectively support the student during clinical learning (Mabuda *et al.*, 2008:19). Effective supervision includes that supervisors be aware of health professional students' previous experiences, and which level of skills development would ensure independence by letting them perform tasks and take care of patients (Jeppesen *et al.*, 2017:120; Kilty *et al.*, 2017:226). Supervisors can only create a positive CLE with good collaboration and communication from the HSEIs (Hooven, 2014:320). An appropriate level of systems support in a CLE creates the opportunity to support students physically and cognitively.

2.6.4.4.2 Cognitive support

Cognitive support refers to the support that health professional students need to transfer their learning in the clinical setting through the development and use of thinking operations. Thinking operations include critical thinking; clinical reasoning; clinical judgment and metacognition. To promote the development of these cognitive processes, supervisors need to spend sufficient time with students in the CLE, giving individual attention to effectively support cognitive improvement (Botma & Mackenzie, 2016:105). Health professional students' cognitive ability is described by Abed *et al.* (2015:468) as the ability to learn, retain and apply knowledge introduced during a training programme. A major concept in the transfer of learning is the link between classroom theory and practice in the CLE. To minimise the gap between theory and practice, supervisors need to use innovative learning activities and strategies to support the students' cognitive development.

Clinical training strategies like provision of clinical facilitators; dedicated educational units; etc. are innovative teaching strategies that support health professional students in being actively involved with their learning (Phuma-Ngaiyaye *et al.*, 2017:164). Clinical facilitators are described as expert healthcare professionals who are trained in clinical teaching to provide students with guidance, support and experience (Phuma-Ngaiyaye *et al.*, 2017:164). Training programmes and facilitator support are identified by various studies as major contributing factors in transferring learning successfully (Thomson *et al.*, 2017:520; Botma & Mackenzie, 2016:105; Papastavrou *et al.*, 2010:184). Health Science Education Institutions often appoint clinical facilitators with the primary goal of supporting students' cognitive development and motor skills in the CLE (Williamson *et al.*, 2010:828). Therefore, clinical facilitators are in an ideal position to assist the development of excellent learning environments, where theory and practice complement each other and the focus is on health professional students' learning needs rather than service and clinical patient care. Furthermore, they can implement the innovative learning activities needed to facilitate clinical reasoning for people-centred care (Botma & Mackenzie, 2016:106; Saarikoski *et al.*, 2009:595). For example, facilitation of reflection during and after clinical activities is part of an innovative learning process that increase a student's professional competence level (Meyer *et al.*, 2009:131).

While systems and cognitive support are essential in such a complex learning environment, attention should be given to emotional support, which is as important.

2.6.4.4.3 Emotional support

Emotional support includes showing interest in health professional students, so instilling confidence and feelings of value in them Hugo *et al.* (2018:83), as well as encouraging them to optimise learning opportunities, and achieve their learning outcomes (Govina *et al.*, 2017:241). A CLE might offer high-quality learning opportunities, but the health professional student may still experience it as being negative. Supervisors should always consider students' emotional reactions to their clinical experiences and deal with them pro-actively, ensuring that experiences in CLEs remain positive (Papastavrou *et al.*, 2016:2; Lekalakala-Mokgele & Caka,

2015:1). Kaphagawani (2016:31) concludes that health professional students' clinical performances increase when the necessary support is found in the CLE.

Effective supervisor support increases healthcare students' feelings of satisfaction about any supervision received in the clinical setting, especially if high quality people-centred care is being delivered at the same time (Sercekus & Baskale, 2016:134; Smith, 2012:172).

2.6.4.5 *Working with patients*

CLEs are significant to students' learning, as these environments offer opportunities to work with real patients with genuine health problems, versus simulation in teaching laboratories (Arpanantikul & Pratoomwan, 2017:121; Bergjan & Hertel, 2013:1393). The authentic environment of the CLE increases health professional students' clinical experience, thereby directly influencing their transfer of learning (Srimannarayana, 2016:263). Kedge and Appleby (2010:586) describe the CLE as an environment that promotes curiosity in students to enhance their professional competency. In studies where students felt that CLEs were "doing the right thing," in "the right way", and "always", regarding people-centred care, students' professional competency was increased (Hooven, 2015:421). In these clinical settings the people-centred care was managed by students, under the supervision of clinical supervisors.

Health professional students want the opportunity to be actively involved in managing patients' care (Hooven, 2015:423). Educational opportunities should be created, such as clinical meetings where students can ask questions regarding patient care if they want to know more or do not understand what is expected from them (Chuan & Barnett, 2012:192; Saarkoski *et al.*, 2009:595). Health professional students gain confidence during people-centred care delivery, while patients receive high-quality care due to the presence of an expert supervising the student's performance (Meyer *et al.*, 2009:161).

As previously discussed, evaluation of health professional students' performance in the CLE is one way of establishing the mastering of the learning outcomes and students' professional competence.

2.6.4.6 *Clinical assessment and feedback*

The CLE enhances learning through the provision of optimal learning opportunities, health professional student support, guidance, as well as timely and fair proficiency assessments (Kaphagawani 2016:31; Papastavrou *et al.*, 2010:117; Saarikoski *et al.*, 2009:599). All health professional students should receive timely feedback after formative and summative evaluation. Students mark their satisfaction if they receive continuous feedback on any professional performances (Papastavrou *et al.*, 2016:2; Hooven, 2015:424; Lekalakala-Mokgele & Caka, 2015:2). Supervisors should provide constructive feedback to health professional students, whether positive or negative in nature (Liu *et al.*, 2015:128). Constructive feedback contributes to students' performance by addressing the shortcomings and identifying the learning needs (Govina *et al.*, 2017:241). On the other hand, students can use reflection of their own actions to measure their own performance.

Reflection or reflective thinking allows health professional students to measure their clinical learning by stepping back and contemplating their personal WIL experiences (Mantzourani *et al.*, 2019:1476; Dimitriadou *et al.*, 2015:241). Health professional students' analysis of their performance in the CLE leads to identification of areas to improve on in future performances (Kilty *et al.*, 2017:1). In the same trend, reflective learning strategies are identified as ways to reach better professional competence in the CLE.

The learning opportunities offered by a clinical setting are an important aspect that contributes to the success of an authentic learning environment. The level of availability, guidance and support of learning opportunities in a clinical setting makes students feel more satisfied with a CLE.

In conclusion, the CLE consists of various aspects that contribute to health professional students' competence. During the overview of the available literature for this study, the researcher identified four main aspects of high-quality CLEs, which have been labelled pillars. The first pillar is described as consisting of the atmosphere or ambiance which is set for student learning; the second pillar reflects the teamwork between role-players, inter-professions and peer students; while the third refers to the workload of the clinical staff and students. The fourth and last pillar concerns the essential learning opportunities offered by the clinical facility. An overview of the available literature on measuring the success of CLEs clearly highlights the importance of these aspects in the establishment of high-quality CLEs.

2.7 EVALUATION OF EXISTING CLINICAL LEARNING ENVIRONMENT MEASURING INSTRUMENTS

Overview of the literature considered various aspects in a clinical setting as pivotal to the development of professional competence in health professional students. For the sake of completeness, the researcher of this study viewed several instruments for measuring CLEs (see Table 2.1). Only instruments measuring CLEs relevant to health science professions such as nursing and medicine were considered.

From this review, the researcher identified that although there are instruments available to measure CLEs, there are still some limitations in the exact measurement of all aspects identified as influencing the CLE.

TABLE 2.1: Summary of existing CLE measuring instruments, and their main aims

AUTHOR	NAME OF INSTRUMENT	HEALTHCARE DISCIPLINE	AIM
Sand-Jecklin, K	Student Evaluation of Clinical Education Environment (SECEE) inventory	Nursing	Measures nursing students' perception of their CLE.
Saarikoski, M; Leino-Kilpi, H & Warne, T	Clinical Learning Environment And Supervision (CLES) Scale	Nursing	Describes student perceptions of the clinical environment related to supervision and the overall atmosphere.
Chen, H.; Holton, E.F. & Bates, R.	Learning Transfer System Inventory (LTSI)	All professions	Measures transfer and organizational results.
Abraham, R; Ramnarayan, K; Vinod, P. & Torke, S.	Dundee Ready Education Environment Measure (DREEM)	Medical practitioners	Assesses the perception of undergraduates' educational environment.
Salamonson, Y.; Bourgeois, S.; Everett, B.; Weaver, R.; Peters, K. & Jackson, D.	Clinical Learning Environment Inventory (CLEI-19)	Nursing	Reviews student perceptions of the practice environment; how and what students learn
Chuan, O.L. & Barnett, T.	Chuan & Barnett's Questionnaire	Nursing	Compares student nurse, staff nurse and nurse tutors' perceptions of the clinical learning environment to identify factors that enhanced or inhibited student learning
Anderson, A.; Cant, R. & Hood, K.	Inter-professional Clinical Placement Learning Environment Inventory (ICPLEI)	Inter-professional	Measures students' perceptions of key variables in an inter-professional clinical learning environment.
Jalili, M.; Hejri, S.M.; Ghalandari, M.; Moradi-Lakeh, M.; Mirzazadeh, A. & Roff, S.	Postgraduate Hospital Educational Environment Measure (PHEEM)	Medical practitioners	Assesses the learning environments of interns.
Palese, A.; Dante, A.; Tonzar, L. & Balboni, B.	N2N Healthy Work Environment tool	Nursing	Assesses the wellbeing of work environments as perceived by nurses and identifies the factors associated with nurses' perception of work environment fitness.

AUTHOR	NAME OF INSTRUMENT	HEALTHCARE DISCIPLINE	AIM
Nepal, B.; Taketomi, K.; Ito, Y.M.; Kohanawa, M.; Kawabata, H.; Tanaka, M. & Otaki, J.	Clinical Learning Environment, Supervision and Nurse Teacher Evaluation Scale (CLES-T)	Nursing	Assess student nurses' perceptions of their clinical environment.
Dadgaran, I.; Shirazi, M.; Mohammadi, A. & Ravari, A.	Self-Developed Instrument	Nursing	Measures effective factors for clinical learning of nursing students.
Serrano-Gallardo, P.; Martinez-Marcos, M.; Espejo-Matorrales, F.; Arakawa, T.; Magnabosco, G.T. & Pinto, I.C.	Clinical Placement Evaluation Tool (CPET)	Nursing	Identifies the student's perception about the quality of clinical placement and the influence of different tutoring processes in clinical learning.
Krupat, E.; Borges, N.J.; Brower, R.D.; Haidet, P.M.; Schroth, W.S.; Fleenor, T.J. & Uijtdehaage, S.	Educational Climate Inventory (ECI)	Medical practitioners	Measures the educational climate of medical practitioners.
Shivers, E.; Hasson, F. & Slater, P.	Clinical Learning Environment Inventory (CLEI)	Nursing	Assesses the clinical learning environment and perceptions of the social climate and how it impacts on student learning outcomes.
Sethi, A. & Khan, A.	Dental Clinical Learning Environment Instrument (DECLEI)	Dentist	Assesses the clinical learning environment in dental institutes.
Pereira-Lima, K.; Silva-Rodrigues, A. P. C.; Marucci, F. A. F.; Osorio, F.; Crippa, J.A. & Loureiro, R.	Brazilian-Portuguese version of Seelig's Resident Questionnaire	Medical practitioners	Measures the clinical learning environment of residency programs.
Pacifico, J.L.; Van der Vleuten, C.P.M.; Muijtjens, A.M.M.; Sana, E.A. & Heeneman, S.	Dutch Residency Educational Climate Test (D-RECT)	Medical practitioners	Evaluation of the clinical learning environment in postgraduate training settings

AUTHOR	NAME OF INSTRUMENT	HEALTHCARE DISCIPLINE	AIM
Hooven, K.	Collaboration of Clinical Learning Environment (CCLE)	Nursing	Measures the collaboration between nursing faculty members and clinical staff.
Mosia, S.J. & Joubert, A.	Primary Healthcare Clinical Practice Learning Environment	Nursing	Measures the primary healthcare setting as a clinical practice learning environment.

Most of the instruments in this evaluation were developed to measure different purposes and aspects of the CLE, as indicated. Additionally, the Clinical Learning Environment Inventory (CLEI) was developed to measure the perceptions of the social climate and the impact thereof on student learning outcomes (Shivers *et al.*, 2017:58). In application, the Clinical Learning Environment scale (CLE) evaluates the network of forces that have an impact on student learning in the CLE (Dunn & Burnett, 1995:1172), while the quality of clinical nursing education is measured by the Student Evaluation of Clinical Education Environment scale (SECEE) (Sand-Jecklin, 2000:2). A Clinical Learning Environment and Supervision (CLES) instrument was similarly developed to describe students' perceptions of the CLE in relation to supervision and atmosphere. This instrument was later adapted to measure the role of the nurse teacher in the CLE (Nepal *et al.*, 2016:181; Hooven, 2014:318; Bergjan & Hertel, 2013:1393; Saarikoski, Leino-Kilpi, H. & Warne, 2002:341).

Furthermore, to measure the nursing student's perception of the primary healthcare environment, the Clinical Placement Evaluation Tool (CPET) and Primary Healthcare Clinical Practice Learning Environment tool were developed as well (Serrano-Gallardo *et al.*, 2016:1). Serrano-Gallardo *et al.* (2016:1) specifically wanted to identify students' perceptions about the quality of clinical placement and to measure the influence of different teaching designs for primary healthcare clinical learning with the CPET. Chuan and Barnett (2012:193) had developed a scale to measure the atmosphere, relationships, integration of theory and practice, and peer support in nursing clinical learning environments.

Three of the reviewed instruments are meant to measure the CLE of student medical practitioners. The Dutch Residency Educational Climate Test (D-Rect) and Postgraduate Hospital Educational Environment Measure (PHEEM) are used to measure the learning environment of post-graduate medical students. The D-Rect instrument has a strong theoretical foundation of socio-cultural concepts (Pacifico *et al.*, 2018:2), while the PHEEM scale focuses on measuring the physical, emotional and intellectual components of a CLE (Naidoo *et al.*, 2017:236). The Dundee Ready Education Environment Measure (DREEM) was designed for use with undergraduate medical students. DREEM measures the educational environment

with special attention to the perceptions of learning, teachers, academic self, atmosphere, and social self. Hyde *et al.* (2018:2) has indicated that DREEM is more suited to measure the learning environment in a preclinical setting, than in a complex working clinical facility. Sethi and Khan (2018:359) used the Dental Clinical Learning Environment instrument (DECLEI) to measure the suitability of dental CLEs, as the DECLEI instrument is very specific to the professional identity of dentists.

The researcher could moreover not ignore the inter-professional learning that is such a pivotal part of students' clinical educational preparation, as highlighted by the WHO (2010:online). WHO states that students' clinical placement should include critical skills such as teamwork and collaboration. The Inter-Professional Clinical Placement Learning Environment Inventory (ICPLEI) was developed to test the variables of an inter-professional CLE (Anderson *et al.*, 2014:518). The authors measured nine domains from nurses' and medical practitioners' hospital wards as their CLE. However, this instrument lacks measurement of clinical supervision, and supports the effect of meaningful relationships with role-players; bullying; quality of clinical settings and the availability of learning opportunities. Hooven (2016:130) subsequently developed the Collaboration of Clinical Learning Environment (CCLE) scale to measure the aspects of collaboration in the CLE.

It is therefore clear that there are numerous instruments to measure the CLE, but the focus mostly centres on a single healthcare profession's CLE, or there are limitations in the aspects of the CLE being measured. This researcher identified a need for a comprehensive instrument to measure the quality of the CLE for all healthcare professionals, to ensure professional competence in students.

2.8 SUMMARY

In this chapter, the literature that was consulted for this study was discussed. The literature revealed that high-quality clinical learning environments conclusively contribute to the professional development and competence of health professional students. Thus, the current situation of healthcare professionals was investigated,

and the role that HSEIs play in creating a competent healthcare workforce for future health needs was reviewed. Clinical placement of health professional students has been identified as a key factor for them to transfer their learning and become professionally competent. The researcher summarised four main pillars during the literature overview, viewed as important aspects that contribute to a high-quality clinical learning environment for students to learn in. These pillars are identified as atmosphere, teamwork, workload, and available learning opportunities in the clinical setting. Clinical settings are proven to provide authentic, high-quality educational experiences for students. The atmosphere in a clinical setting contributes to the students' sense of work satisfaction and the quality of their learning experience. The atmosphere is enhanced when there is a positive team spirit and teamwork among healthcare professionals. Teamwork provides many opportunities to learn in a secure atmosphere by observing team members apply vocational skills themselves, and through interaction or feedback from other team members. To work in a team implies that students and other health science professionals work as a single unit, applying the group dynamics essential for the functioning of the team. The workload of the CLE affects people-centred care and the learning of students, as the availability of learning opportunities helps students transfer their learning and reach their clinical outcomes. Literature has pointed out that not all CLEs are equally suitable for promoting students' clinical professional competence. Health Science Education Institutions need to measure clinical facilities and ensure that they offer the necessary learning opportunities and support for the students' clinical outcomes. Assessment by way of the four pillars would ideally identify CLEs for students' WIL.

The present study has developed an instrument to measure the clinical learning environment in health science. The next chapter will outline the methods used to develop this CLE measurement instrument.

CHAPTER 3

Methodology

3.1 INTRODUCTION

In Chapter 2, an overview of literature on the clinical learning environment (CLE) was discussed. Chapter 3 describes the scientific research process that was followed during the course of this study. The scientific research process is also known as the methodology.

Methodology refers to the research design, methods, approaches, and procedures used to gain knowledge about the research problem, conveying the logical flow of the systematic processes that were applied (Kivunja & Kuyini, 2017:28). In this case, the researcher identified a knowledge gap in the development of holistic measuring instrument(s), fit for CLEs in the health sciences.

The researcher has chosen a positivist paradigm that relies on deductive logic to investigate the problem, collect and analyse data, before generalising the results obtained from the research to apply to other situations through inductive inferences. A positivist paradigm advocates the use of quantitative research methods for the precise description of data collection processes, analysis, and interpretation of the data to the conclusion stage.

In a methodological study, it is important to understand the research paradigm.

3.2 RESEARCH PARADIGM

The research paradigm is a philosophical way of thinking. According to Kivunja and Kuyini (2017:28); Botma *et al.* (2010:39) and Scotland (2012:9), a paradigm is defined as a basic set of beliefs or worldview that guides a researcher's actions or investigation. It can be seen to be a lens through which an investigator looks at the

world and applies his research methods. The researcher's perspectives, thinking patterns, school of thought, and what he / she believes influences how data will be analysed and the decisions that will be taken.

Creswell (2014:46) goes further, describing a researcher's worldview as his general philosophical orientation about the world, and an indication of the nature of the investigation that will be brought to each study. In order to conduct scientific research, our world reality influences our decisions on the approach to answering a research problem. In health sciences, the clinical learning environment (CLE) is believed to contain knowledge and basic principles assumed to be absolute truth and therefore objective. As such, a positivist paradigm is influential to this study.

3.3 POSITIVISM

Positivism is defined as a systematic way of doing research, also known as the scientific method (Kivunja & Kuyini, 2017:30; Botma *et al.*, 2010:42). Polit and Beck (2012:12) describe the assumption of positivism as the view that there is a reality out there that can be studied, and be known. Positivism is used to search for cause-and-effect relationships in nature. In this worldview, a researcher interprets observations in terms of facts or measurable entities. Kivunja and Kuyini (2017:31) indicated that research with a positivist approach relies on deductive logic and orderly, disciplined procedures which can explain and predict, and are centred on measurable outcomes, are commonly based on the four assumptions of determinism, empiricism, parsimony and generalisability.

An assumption of *determinism* means that observed events are caused by identifiable, other factors. An assumption of *empiricism* means that in order to investigate a research problem, the researcher needs to be able to collect verifiable data. Thirdly, the ability to explain studied phenomena in the most economical way refers to *parsimony*. Lastly, in reference to the assumption of *generalisability*, the results of studied phenomena should be applicable to other situations through inductive inferencing. The positivism approach is defined and characterised by these assumptions, as well as the procedures and regulations that are applied.

Positivists have identified certain regularities, known as social laws. Social laws give a researcher the opportunity to describe, predict and control studied phenomena. The researcher's own values should not be part of the research process, and should therefore not influence the data collection process. Due to the positivist assumptions, procedures and regulations advocated by this approach, it is ideal for quantitative research methods.

Kivunji and Kuyini (2017:26) and Scotland (2012:9) furthermore support that, in turn, a paradigm comprises of four elements: Epistemology, ontology, methodology and axiology.

3.3.1 Ontology

Ontology is concerned with the *nature* of reality. Within positivist views, reality provides results as it is grounded in the real world and regulated by natural causes. It is mainly concerned with how the researcher sees the world. Kivunja and Kuyini (2017:27):define ontology as the assumptions we make in the belief that something is real, or lies at the very nature or essence of a social phenomena. This impacts on how it should be investigated, and helps the researcher conceptualise whether what is believed about reality, can be known and trusted. The nature of reality is required in order to comprehend a research problem, understand and make meaning of information that is collected, and decide how data contributes to its solution.

The ontology of this research study is based on the reality that the CLE can be measured and assessed. Therefore the nature of knowledge and reality guided the researcher in making a decision about the research approach.

3.3.2 Epistemology

Epistemology deals with knowledge, and how we come to know something (Kivunja & Kuyini, 2017:26), and how a researcher relates to what is being investigated (Polit & Beck, 2012:12). Botma *et al.* (2010:40) indicate that epistemology has certain

characteristics, including nature, form, and how knowledge is acquired. It focuses on the structure or format of knowledge, rather than on content. Epistemology deals with the question of *how* to know and explain something. It identifies principles or rules that determine how social phenomena could be known, and how to uncover knowledge to be investigated in a social context (Kivunja & Kuyini, 2017:27).

The epistemology in this study is grounded on the empirical knowledge of experts in this field of science. The researcher scrutinised existing knowledge, including current CLE assessment instruments on the subject to identify any gaps. In order to effectively address the research problem (the development of a new CLE measuring instrument), the researcher has made use of current expert opinion. A methodological study with a Delphi technique was used to confirm face and content validity. The data from the Delphi technique was quantified to ensure precise measurement.

3.3.3 Methodology

Methodology focuses on *how* we come to know the world or gain knowledge about a part of it. The process describes the logical flow of systemic processes followed in the research project to answer the research problem (Kivunja & Kuyini, 2017:28). Methodology is a broad term used to refer to the research design; methods; approaches and procedures used in an investigation, including the conclusions and limitations that were encountered, and how they were minimised.

Polit and Beck (2012:13) question how best to obtain evidence. The positivist solution is to use deductive processes; focus on the objective and how to quantify it; incorporate outsider knowledge; apply a fixed, pre-specified design; tightly control context and statistical analysis of data; seek generalisations, and focus on the outcome. For this study, the researcher applied methodological design and deductive processes to develop a new measuring instrument to quantify a CLE. Outsider knowledge was used by gathering input from experts in the subject. Tight controls were applied by means of strict inclusion and exclusion criteria. The

collected data was statistically analysed, interpreted and positivist conclusions were drawn to seek the best evidence and knowledge about CLEs.

3.3.4 Axiology

Axiology is concerned with the role of values in an inquiry. As objectivity was sought during this study, the values and biases of the researcher were held in mind and regularly checked (Polit & Beck, 2012:13). Based on personal beliefs and values, the researcher made a series of decisions which guided the study process. The individual values of everyone involved, or had participated in the research study were considered throughout the process by applying three grounding ethical principles.

The three ethical principles applied throughout this study include respect for people; beneficence and non-maleficence, as well as distributive justice (Polit & Beck, 2012:152; Botma *et al.*, 2010:17). As the second phase of the study included gathering the opinions of external experts, the researcher took the key norms and standards of the country's National Department of Health into consideration while performing research that included human beings (2015:14).

3.4 RESEARCH APPROACH

A research approach determines the methodology of a study, to verify whether the problem should be phrased as a hypothesis or a research question. This method guides researchers on whether the goal of the research must be descriptive, explanatory or exploratory in nature. It also influences the choice of which design to follow, and the data analysis method that should be used. According to Botma *et al.* (2010:42), there are three dominant approaches to research, namely positivism, interpretivism and critical theory. Creswell (2014:36) identified four principle approaches, however, which includes post-positivism. This refers to positivist, empirical science and post-positivism. Positivism follows the worldview of truth being absolute knowledge, while constructivism holds the belief that individuals seek to build understanding of the world in which they live and work. The latter two

approaches are transformative worldviews, usually attributed to pragmatists (Creswell, 2014:38).

As stated, this researcher decided on accepting the worldview of positivism, which advocates using quantitative research methods.

3.5 QUANTITATIVE RESEARCH METHODS

Research methods are the techniques or designs used to formulate a study and to collect and analyse any information relevant to the research question (Polit & Beck, 2012:12). The paradigm of positivism is compatible with quantitative research methods. Quantitative research is defined as a method following a prescribed, objective, systematic approach to investigating phenomena requiring precise measurement (Polit & Beck, 2018:8; Grove *et al.*, 2013:23).

The unique characteristics of quantitative research methods are listed in Table 3.1.

TABLE 3.1: Characteristics of quantitative research

CHARACTERISTIC	RASIONAL
Theory	Tests theories generated by qualitative research.
Number of concepts investigated	Focus falls on a small number of concepts.
Researcher role	The researcher does not participate in the data collection process, but keeps a distance.
Control	Follows a clear plan during implementation.
Type of instrumentation	Requires developing and implementing research instruments.
Unit of analysis	Numbers are the basic element of analysis.
Data analysis	Statistical analysis of data.
Purpose of research outcomes	Generalise research results to a larger setting.

Quantitative research designs can be divided into three main categories, namely a) experimental and quasi-experimental designs; b) non-experimental designs, and c) additional types of quantitative designs (Lo-Biondo-Wood & Haber, 2010:178).

- a) Experimental and quasi-experimental designs: One purpose of scientific research is to determine a cause-and-effect relationship, using experimental and quasi-experimental designs to test the effect of an intervention. Because of the rigorous control over the variables, experimental studies are considered to be the most dominant quantitative method (Grove *et al.*, 2013:26).
- b) Non-experimental designs: Non-experimental designs include descriptive designs and correlation designs. A descriptive design is used if the researcher wants to describe a variable of interest as it naturally occurs. This is often used when little is known about a topic (Grove *et al.*, 2013:26; Botma *et al.*, 2010:110). Correlation designs involve the systematic investigation of existing relationships between variables, specifically between an independent and dependant variable (Grove *et al.*, 2013:26; Botma *et al.*, 2010:113).
- c) Additional types of quantitative designs: Polit and Beck (2018:222) and Lo-Biondo-Wood and Haber (2010:207) list other types of quantitative designs that do not fit into the spectrum of traditional research designs. They include
 - 1) Systematic reviews, referring to a summary of quantitative research literature that previously used similar designs, based on a focused clinical question;
 - 2) Meta-analyses, which are statistical techniques used to summarise and assess studies with the same design to obtain a precise estimate of effect. Meta-analyses are convincing because of the rigorous process that is followed;
 - 3) Integrative reviews, which critically appraise subject literature without statistical analysis, and can include theory and research literature reviews;
 - 4) Secondary analysis, a research method that uses previously collected and analysed data from one study to re-analyse the data / subset of the data for a secondary purpose; and lastly
 - 5) Methodological designs, referring to the development and evaluation of instruments that measure constructs used as variables in research. The process for this is lengthy and complex, however.

The researcher decided to follow a methodological research design, classified as an additional type of quantitative method, to develop an instrument that measures all the major aspects of the CLE. This quantitative research method provided the structure of the study and the strategies to track the development of the instrument.

3.5.1 Methodological research

Methodological research is defined as seeking ways of obtaining high-quality data-collection instruments and conducting rigorous research (Polit & Beck, 2018:8). Rigorous research is achieved with valid and reliable instruments that measure the constructs used as variables (Grove *et al.*, 2013:255). Methodological research is directional in nature, a strategy used by researchers to plan and implement studies to achieve an intended goal (Polit & Beck, 2012:268, LoBiondo-Wood & Haber, 2010:207). An important aspect of methodological research is the psychometrics of the instrument (LoBiondo-Wood & Haber, 2010:207). Psychometrics deal with the theory and development of measurement instruments during the research process. Therefore, in this study, the methodological research would deal with the measurement of the CLE, as a concept.

During the execution of the methodological research process, it is crucial to determine the validity and reliability of data, and to aim to develop high-quality instrument, which will draw valid and reliable conclusions about the new instrument (Polit & Beck, 2018:222). Polit and Beck (2018:222) and LoBiondo-Wood and Hober (2010:207) concluded that a methodological research design can be seen as one way to create new knowledge. Methodological research is powerful in delivering sound evidence for a rigorous instrument.

It is important to start with a clear construct to measure, and that the development and evaluation processes are done systematically, as was done in this study. Therefore, the concept of the CLE was defined before any other steps of activity followed. A well-defined CLE provided a working theory of the study phenomenon, easing the process of item generation and content validation. As depicted in Figure 3.1, methodological research can be divided into three phases.

The first phase started with the general literature overview of a CLE. The literature overview was done by securing existing and available CLE measurement instruments. Knowledge was accumulated from the existing spectrum of measurement of CLEs. An inductive method was followed to generate new items, after which the items were thematised and the first version of the new instrument was compiled.

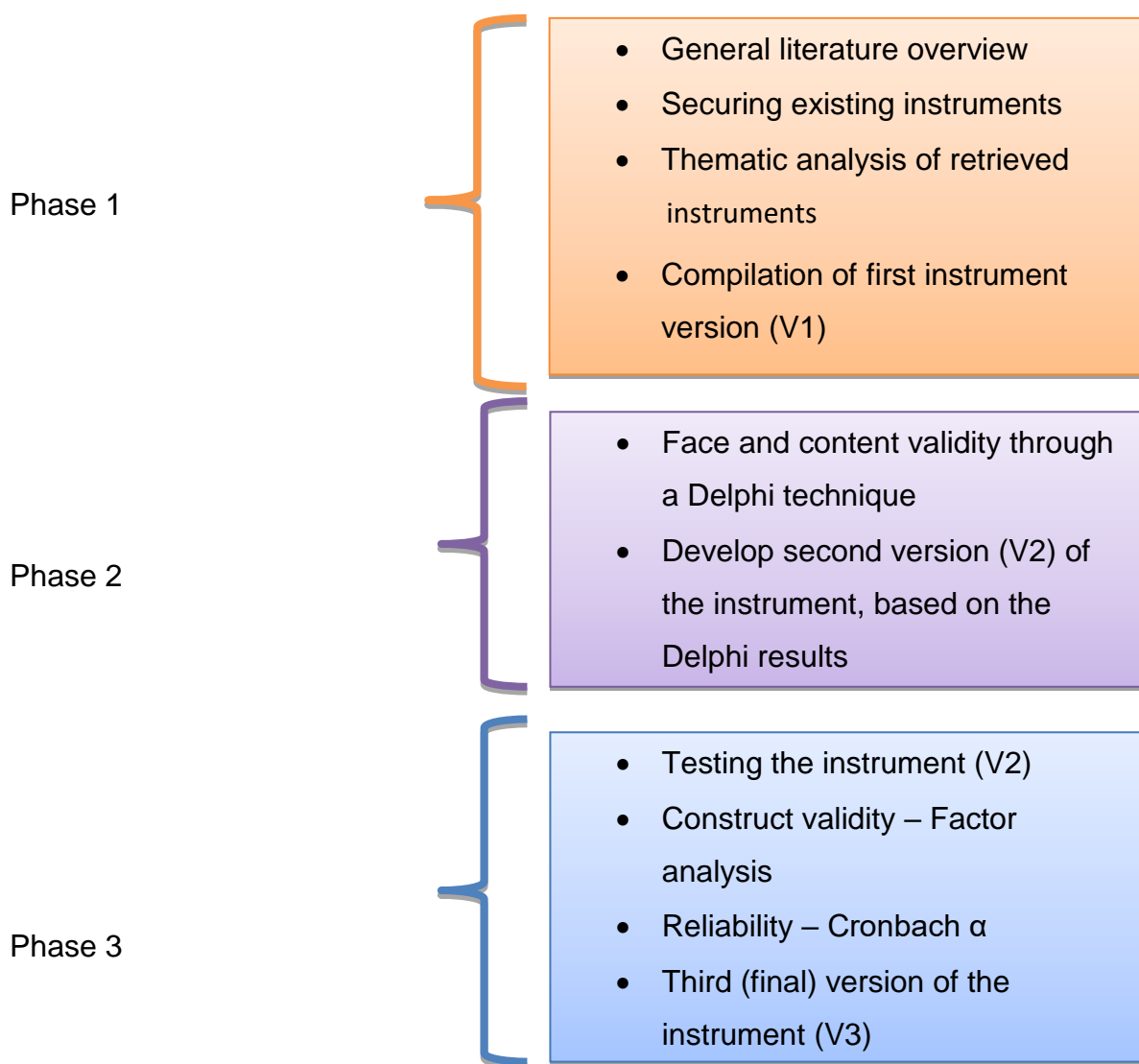


FIGURE 3.1: Phases of developing instrumental items

Phase 2 determined the face and content validity of the instrument's first version, as developed in Phase 1. In Phase 2 an expert panel also confirmed the face and content validity of the instrument through a Delphi survey technique. In Phase 3, the instrument should be tested for construct validity and reliability. ***For the purpose of***

this study, the researcher only developed the instrument, and determined the face and content validity thereof. Testing of the instrument would be part of another study.

The intended population for this instrument is included as it influences the development of the instrument. The instrument was developed to measure the CLEs of health professional students. Therefore the intended population for the study would be health professional students.

3.5.1.1 *Intended population*

As the aim of this study was only to develop the instrument, and not to test it, details such as the number of students involved by year-group and profession will not be discussed. The discussion only elaborates on the intended population for whom this instrument was designed.

A population refers to all the elements that meet the specific inclusion criteria for the research study, which, in this case, are individuals (Polit & Beck, 2018:162; Grove *et al.*, 2013:703). The new instrument aims to give feedback on the CLE. Therefore, the intended population would be all undergraduate and postgraduate health professional students enrolled in a health science profession degree, who are placed in the CLE for work-integrated learning (WIL). For the sake of this study, health professional students would include aspiring biokineticists; dentists; dietitians; nurses; occupational therapists; optometrists; paramedics; physiotherapists; medical physicians and technologists; pharmacists, and radiographers. The development of an instrument to measure an effective CLE is a complex process, and careful planning should be done beforehand (Grove *et al.*, 2013:255).

3.5.2 Phase 1: The development of a draft instrument through a literature overview

A well-developed instrument can contribute to valid and reliable clinical assessments in the CLE (Polit & Beck, 2012:295). For the advancement of such an instrument, the researcher used the framework for tool development formulated by Jones (2004:298). A general overview of the existing literature guided the researcher on which CLE elements should be measured.

In reference to Figure 3.2, the researcher performed a general overview of literature to identify existing, relevant instruments that measure the CLE. The content of these current instruments was reviewed. It was found that none of the current instruments measured all the major aspects of a CLE. The researcher concluded that the present study's set criteria were not met by the existing instruments.

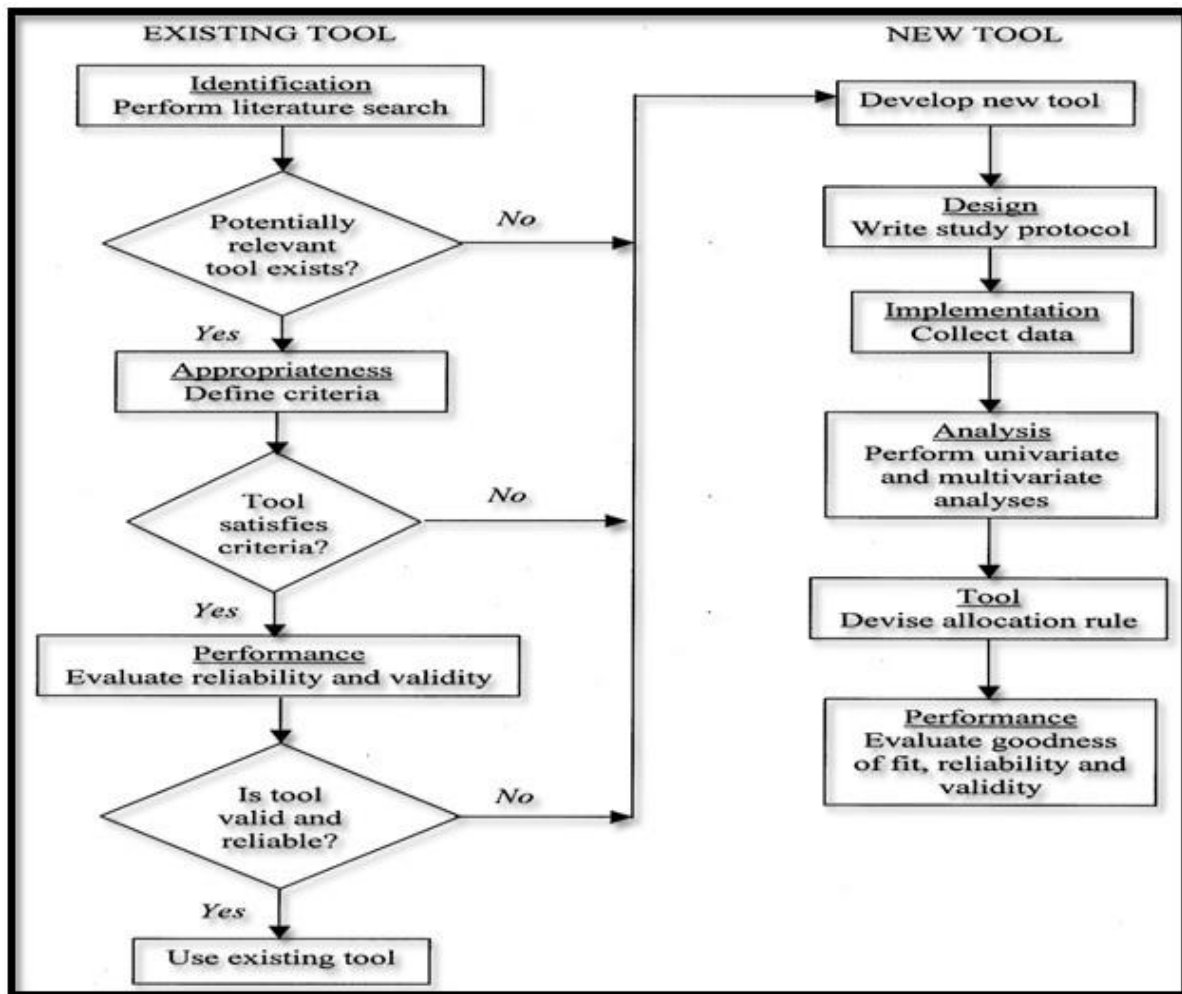


FIGURE 3.2: Jones' Flow Chart, depicting the identification and assessment of an existing tool, and the development of a new one (Jones, 2004:298)

Elements important to the current CLEs were found missing in the existing instruments. A new instrument is thus needed to measure the CLE for health professional students. After scrutinising what was available, the researcher wrote a study protocol for developing a new instrument for the health sciences. The extracted items that were fitting for the new instrument were thematised to make them more logical.

Item construction and selection of a design to be followed for the new instrument are discussed in the following sections.

3.5.2.1 General overview of the literature

The instrument development commenced with a general literature overview of existing sources. According to Snellenberger and Mahan (1982:152) the advantage of using existing instruments is that the groundwork has already been done. The researcher decided to consolidate all the items captured from the existing instruments to create a new instrument, rather than just adapting an existing tool. Boateng *et al.* (2018:151) and Polit and Beck (2012:351) concur that sound conceptualisation of a construct to be measured is crucial when developing new instrument. Consequently, the researcher first familiarised herself with the existing literature on CLEs, as captured in Chapter 2, to measure what the instruments already contained, and then decided which elements were to be captured in a new instrument.

3.5.2.2 Securing existing instruments

The researcher used the first three of the six generic steps described by Paré and Kitsiou (2017:158) to procure existing instruments:

- Step 1:** Formulating research objective(s)
- Step 2:** Searching existing literature
- Step 3:** Screening for inclusions.

3.5.2.2.1 Step 1: Formulating the research objective

The need for a comprehensive instrument to measure the CLE was already established. Therefore, the objective of this step was to locate any existing instruments on the CLE in published articles. The researcher used the PICOT acronym to identify the research question. PICOT consists of the population (P); intervention (I); comparison of interest (C); outcome (O), and time (T) (Polit & Beck, 2018:29). Table 3.2 indicates the relevant key concepts for the search strategy identified with the PICOT acronym.

TABLE 3.2: Key concepts for the search strategy, per PICOT acronym

CONCEPT	EXPLANATION
Population	Health professional students
Intervention	Assessment: Instruments measuring CLE
Comparison	Not applicable
Outcome	Development of the instrument.
Time	1980 to December 2019

The researcher formulated the PICOT research question as follows: “Which instruments measuring the CLE in health science professions are available since 1980 for development of a new instrument?”

The researcher executed a search from 1980 to December 2019, as it was only since the early 1980s that the National Department of Health had agreed to the integration of most of the South African healthcare professions into a higher education system, which included that students be allocated to a CLE for WIL (Horwitz, 2011:3).

3.5.2.2.2 Step 2: Searching the existing literature

Strategies on how to locate relevant literature had to be devised to enable the researcher to search for relevant literature on the study phenomenon. The researcher decided to make use of a search string to mine for relevant literature. An University librarian was consulted to assist with the search. The librarian evaluated and subsequently amended the search string by removing “social work” from the key search on population group. Unfortunately, “social work” had not produced any relevant articles. The second amendment included adding “assessment”, “measurement”, and “evaluation” to the search outcome.

The following search string was consequently used to execute the search:

“health science” or “healthcare professions” or “health care professions” or “health care professionals” or dietetics or paramedics or medicine or nursing or physiotherapy or optometry or “occupational therapy” or pharmacy or dentistry or biogenetics or radiography or paramedics

AND

"clinical learning environment" or "transfer climate" or "organisational climate" or "work-integrated learning" or "clinical learning" or "placement learning" or "organisational work climate" or "psychological climate" or "practice placement" or "transfer environment" or "learning climate"

AND

Instrument or questionnaire or tool or survey or "self-administered questionnaire" or scale or inventory or evaluation or assessment or measurement

AND

1980 to December 2019

Fifteen scientific databases were used, including Medline with Full Text; PsycINFO; Africa Wide Information; Cumulative Index to Nursing and Allied Health (CINAHL) with full text; Educational Resources Information Centre (ERIC); PsycINFO; Academic Search Ultimate; Education Source; PsycTESTS; Health Source: Nursing / Academic Edition; Science Direct; SocINDEX with Full Text, and PsycARTICLES. The researcher and her supervisor screened the resulting titles and abstracts for inclusion in the study.

The string search identified 306 abstracts that described the measurement of CLE (see Figure 3.3). The librarian succeeded in locating electronic versions of all the selected abstracts.

3.5.2.2.3 Step 3: Screening for inclusion

The researcher and supervisor listed abstracts and articles that met the inclusion criteria. The inclusion criteria comprised of the following:

- Abstracts that described the measurement of the CLE
- Abstracts with reference to an instrument that had been used to describe the quality of the CLE
- Articles without full-length questionnaires, but which included the contents used to measure the CLE
- Full-length questionnaires.
- Only instruments available in English were used
- Instruments that were relevant for health science professions

As listed, the researcher did not consider any instruments which did not correlate with the construct to be measured. Instruments noting only themes or sub-themes of an instrument were excluded due to application of the inductive approach. Non-English language instruments were also excluded, as translation might compromise their validity and reliability, or content and context could be lost in translation.

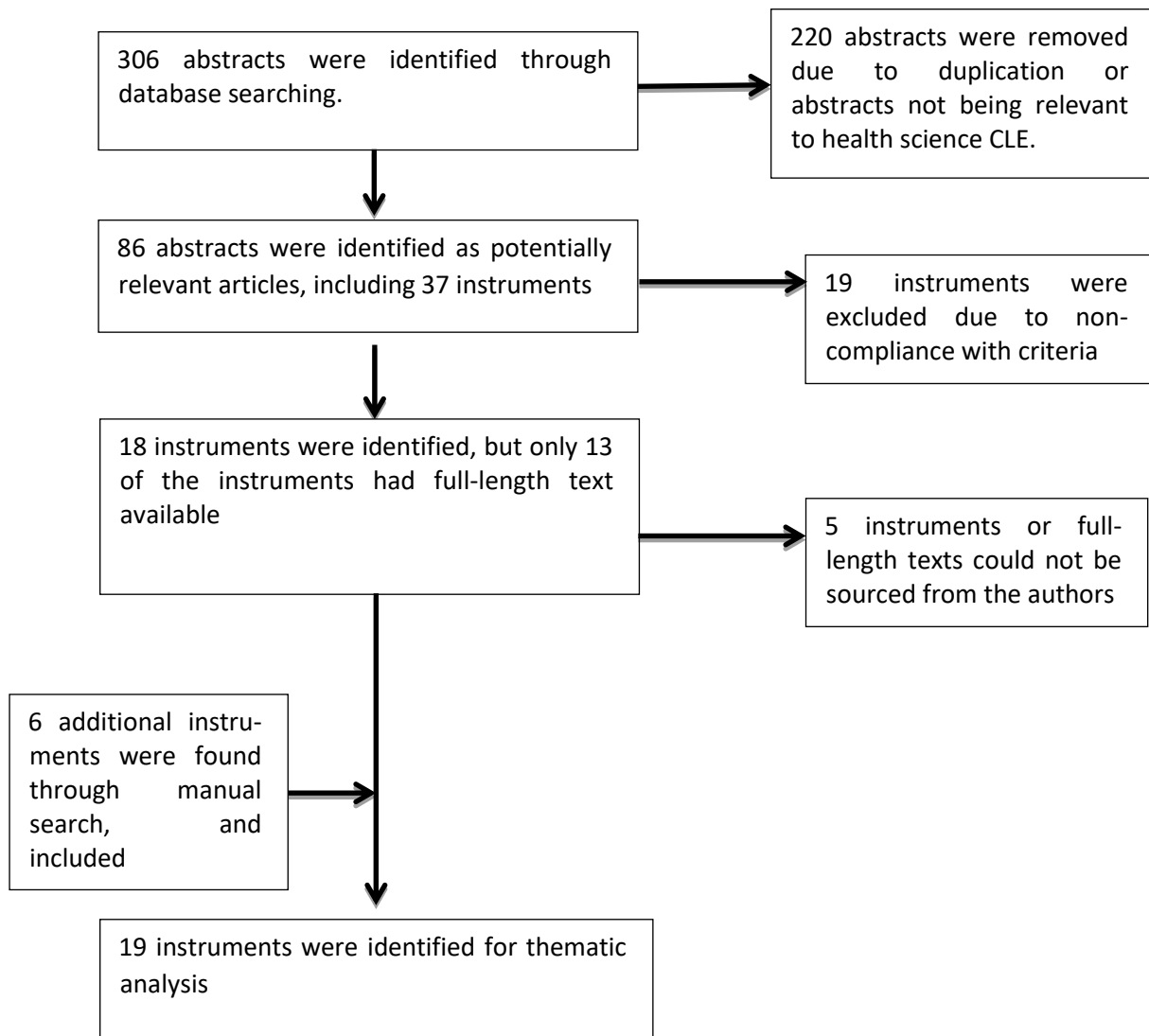


FIGURE 3.3: Flow diagram showing the sampling procedure for the instrument

Of the 306 abstracts found, 220 were removed due to duplication or irrelevance to the health sciences CLE. Eighty-six potentially relevant abstracts with 37 different attached instruments were identified for examination. Of these 37 instruments, 19 were excluded due to either non-compliance with the set criteria, or inaccessibility via the library / the authors. The researcher was left with 18 articles, of which only 13 had full-length instruments attached. Another five instruments were excluded when authors did not respond to a request to provide copies of their full-length instruments. However, during the researchers independent overview of other literature, the researcher was able to add an additional six instruments that also met

the criteria. A total of nineteen different instruments were finally identified for use in the thematic analysis.

The researcher considered that the following criteria in the final instruments rated attention:

- Discussion of relevant content that should be measured, i.e. the CLE
- Reference to appropriate professions, i.e. healthcare sciences
- Adequate contents and length of the instrument (full text)
- The type of instruments applied
- The validity and reliability of the noted discussions.

The chief concern remained that the existing instruments should measure the major aspects of the CLE, as this was the construct being examined. The instrument had to be relevant to the health science professions. The various types of instruments were considered in order to find the most appropriate method to be applied to the new measurement instrument. Existing instruments were further evaluated for suitable validity and reliability. After an in-depth evaluation, the researcher deemed it appropriate to continue with compiling a new instrument as a measurement method and a suitable way to gather leading-edge data.

Table 3.3 gives an overview of the 19 instruments included in this study focus on the type of instrument and gauge of validity and reliability.

TABLE 3.3: Overview of the included 19 relevant instruments

	Author	Year	Article	Instrument	Profession measured	Type of instrument	Gauge of validity and reliability
1	Sand-Jecklin, K	2000	Evaluating students' clinical learning environment: Development and validation of the SECEE inventory	Student Evaluation of Clinical Education Environment (SECEE) Inventory	Nursing	Likert scale	Face and content validity; Coefficient alpha and test-retest reliability
2	Saarikoski, M; Leino-Kilpi, H & Warne, T	2002	Clinical learning environment and supervision: Testing a research instrument in an international comparative study	Clinical Learning Environment and Supervision (CLES) Scale	Nursing	5-point Likert scale	Construct validity; Chronbach alpha
3	Chen, H; Holton, EF & Bates, R	2005	Development and Validation of the Learning Transfer System Inventory in Taiwan	Learning Transfer System Inventory (LTSI)	All professions	5-Point Likert scale	Criterion validity
4	Abraham, R; Ramnarayan, K; Vinod, P. & Torke, S	2008	Students' perceptions of learning environment in an Indian medical school	Dundee Ready Education Environment Measure (DREEM)	Medical practitioners	4-point Likert scale	Construct validity; Chronbach alpha
5	Salamonson, Y; Bourgeois, S; Everett, B; Weaver, R; Peters, K & Jackson, D	2011	Psychometric testing of the abbreviated Clinical Learning Environment Inventory (CLEI-19)	Clinical Learning environment inventory (CLEI-19)	Nursing	4-point Likert scale	Construct validity; Cronbach alpha
6	Chuan, OL & Barnett, T	2012	Student, tutor, and staff nurse perception of the clinical learning environment	Chuan & Barnett's Questionnaire	Nursing	4-point Likert scale	Content validity; Chronbach alpha

	Author	Year	Article	Instrument	Profession measured	Type of instrument	Gauge of validity and reliability
7	Anderson, A; Cant, R & Hood, K	2014	Measuring students' perceptions of inter-professional clinical placements: Development of the Inter-professional Clinical Placements Learning Environment Inventory	Inter-professional Clinical Placement Learning Environment Inventory (ICPLEI)	Inter-professional	5-point Likert scale	Content validity; Chronbach alpha
8	Jalili, M; Hejri, SM; Ghalandari, M; Moradi-Lakeh, M; Mirzazadeh, A & Roff, S	2014	Validating modified PHEEM questionnaire for Pmeasuring educational environment in academic emergency departments	Postgraduate Hospital Educational Environment Measure (PHEEM)	Medical practitioner	5-point Likert scale	Construct validity; Chronbach alpha
9	Palese, A; Dante, A; Tonzar, L & Balboni, B	2014	The N2N instrument to evaluate healthy work environments: An Italian validation	N2N Healthy Work Environment Tool	Nursing	5-point Likert scale	Face and content validity; Test re-test evaluation
10	Nepal, B.; Taketomi, K.; Ito, Y.M.; Kohanawa, M.; Kawabata, H.; Tanaka, M. & Otaki, J.	2016	Nepalese undergraduate nursing students' perceptions of the clinical learning environment, supervision and nurse teachers: A questionnaire survey	Clinical Learning Environment, Supervision and Nurse Teacher Evaluation Scale (CLES-T)	Nursing	5-point Likert scale	Construct validity; Chronbach alpha
11	Dadgaran, I.; Shirazi, M.; Mohammadi, A. & Ravari, A.	2016	Developing an instrument to measure effective factors on clinical learning	Self-developed instrument	Nursing	Semi-structured individual interviews	Construct validity; Chronbach alpha
12	Serrano-Gallardo, P.; Martinez-Marcos, M.; Espejo-Matorrales, F.; Arakawa, T.; Magnabosco, G.T. & Pinto, I.C.	2016	Factors associated to clinical learning in nursing students in primary health care: An analytical cross-sectional study	Clinical Placement Evaluation Tool (CPET)	Nursing	5-point Likert scale	Construct validity; Chronbach alpha

	Author	Year	Article	Instrument	Profession measured	Type of instrument	Gauge of validity and reliability
13	Krupat, E.; Borges, N.J.; Brower, R.D.; Haidet, P.M.; Schroth, W.S.; Fleenor, T.J. & Uijtdehaage, S.	2017	The Educational Climate inventory: Measuring Students' Perceptions of the Preclerkship and Clerkship Settings	Educational Climate Inventory (ECI)	Medical practitioner	4-point Likert scale	Construct validity
14	Shivers, E.; Hasson, F. & Slater, P.	2017	Pre-registration nursing students quality of practice learning: Clinical learning environment inventory (actual) questionnaire	Clinical Learning Environment Inventory (CLEI)	Nursing	4-point Likert scale	Construct validity; Chronbach alpha
15	Sethi, A. & Khan, A.	2018	Is the dental clinical learning environment suitable? A survey of Khyber Pakhtunkhwa, Pakistan	Dental Clinical Learning Environment instrument (DECLEI)	Dentist	6-point Likert scale	Content validity; Chronbach alpha
16	Pereira-Lima, K.; Silva-Rodrigues, A. P. C.; Marucci, F. A. F.; Osorio, F.; Crippa, J.A. & Loureiro, R.	2018	Cross-cultural adaption and psychometric assessment of a Brazilian-Portuguese version of the Resident Questionnaire	Brazilian-Portuguese version of Seelig's Resident Questionnaire	Medical practitioner	5-point Likert scale	Face and content validity
17	Pacifico, J.L.; Van der Vleuten, C.P.M.; Muijtjens, A.M.M.; Sana, E.A. & Heeneman, S.	2018	Cross-validation of a learning climate instrument in a non-Western postgraduate clinical environment	Dutch Residency Educational Climate Test (D-RECT)	Medical practitioner	5-point Likert scale	Construct validity; Inter-rater reliability
18	Hooven, K.	2017	Development and testing of the collaboration in the clinical learning environment	Collaboration of clinical learning environment (CCLE)	Nursing	5-point Likert scale	Content validity
19	Mosia, S.J. & Joubert, A.	2020	Primary healthcare practice learning environment: A description of students' perspectives.	Primary Healthcare Clinical Practice Learning Environment	Nursing	4-point Likert scale	Not reported

3.5.3 Type of instrument

An instrument can be a printed self-reporting form, designed to extract information obtained from subjects' written responses (Polit & Beck, 2018:406; Grove *et al.*, 2013:425). Self-administered instruments, a type of instrument, is a data collection tool in which questions are presented for respondents to answer in writing. Careful consideration should be given to formulating clear and simple questions or statements, as respondents' reading levels / understanding can differ or they might have difficulty in expressing themselves.

Self-administered instruments should be respondent-appropriate. For example, children and the elderly may find it difficult to complete a self-administered instrument. In this study, the respondents include health professional students enrolled in undergraduate or postgraduate tertiary programmes. Therefore, the use of a self-administered instrument is quite fitting. There are a number of further advantages in the use of this type of instrument.

Self-administered instruments are considered to be less expensive than other methods to apply. The expenses involved are in the planning, sampling and reproduction of the instruments. Respondents can participate in any location and at their own convenience, which saves time and effort. The absence of interviewers provide the respondents with a greater sense of anonymity, which ensures less possibility of bias or power coercion during the data collection process (Polit & Beck, 2018:171).

However, there are disadvantages and limitations to be found in this research method as well, mainly that researchers have few or no opportunity for respondents to elaborate and / or clarify what is meant by their responses. There is limited control over the sequence in which statements are answered. The respondent may leave some questions unanswered, especially those that require sensitive or socially undesirable responses. A poor response rate can occur, and incomplete or illegible instruments can be returned to the researcher. It was noted that all 19 of the existing instruments were self-administered instruments, however. Likert instruments were

most commonly used to measure the CLE. The researcher considered the evidence from previous studies, plus the advantages and disadvantages of self-administered instruments, concluding that this type of instrument would be best suited to the study. Consequently, the researcher chose a self-administered Likert instrument to quantify the new CLE measurement data.

3.5.3.1 *Likert instruments*

A Likert instrument is a psychometric instrument with multiple levels or categories on a continuum to determine the opinion, feelings, or attitude towards a topic (Polit & Beck, 2018:170; Nemoto & Beglar, 2014:2; Grove *et al.*, 2013:430). The characteristics of a Likert instrument includes having a) a declarative statement; b) an ordered continuum of response options; c) a balanced number of positive and negative response options, and d) all the response options are labelled, for example “strongly agree” (Polit & Beck, 2018:170; Nemoto & Beglar, 2014:3; Grove *et al.*, 2013:430). One of the major advantages of Likert instruments is that they do not require a “Yes” or “No” answer from the respondent, allowing some degree of opinion.

As always, there are advantages and disadvantages that need to be taken into consideration when employing Likert instruments (Polit & Beck, 2018:170; Munshi, 2014:3; Nemoto & Beglar, 2014:3; Grove *et al.*, 2013:430).

The advantages of Likert instruments include that:

- Responses are collected in a highly standardised manner
- A decrease in bias is assured as declarative items are kept consistent, reflecting a high measure of validity and reliability
- This is a reliable and valid method of measuring psychosocial variables
- It provides respondents with a wider range of choices, which makes them more comfortable in exercising their answers
- The instrument provides reliable estimates of persons’ abilities
- It does not force the participant to take a stance on a particular topic, but allows them to respond with some degree of agreement

- Anonymity can be incorporated into the data collection method, allowing difficult or sensitive information to be collected as no interviewer is necessary
- Data collection can be done quickly, and include a large number of respondents
- It is an efficient and inexpensive way to collect data
- Responses are very easy to code when analysing data, as a single number represents each respondent's response
- Responses are easily quantifiable.

Disadvantages of using a Likert instrument include:

- A failure to uncover in-depth information
- Respondents not being completely honest, which may be intentional or unintentional
- Bad feelings towards the surveyor may compromise respondents' answers
- Respondents answering according to what they feel is expected from them
- A great deal of decision making during the process
- Previous statements influencing responses to later statements.
- Misdirected weights due to a casual approach by respondents
- A narrow spectrum of choice due to the unidimensional character of the instruments
- Analysis becoming time-consuming, working through vast volumes of collected or complicated data.

After taking the mentioned advantages and disadvantages into consideration, the researcher decided that using a Likert instrument would still be the best option for the study's instrument.

As suggested by Polit and Beck (2012:335), the researcher chose four response categories to prevent confusion caused by too many choices. The response options include choices to strongly agree; agree; disagree, or strongly disagree with statements. The options are rated numerically: A count of four indicates "strongly agree"; three is "agree"; two equals "disagree", and one means "strongly disagree". Neutral responses were excluded to encourage respondents to make a definite decision regarding the CLE.

3.5.4 Item construction

Hinken (1995:971) was adamant that constructing new assessment items is the most important part of instrument development. In accordance, this researcher followed a systematic process in constructing the new items. Existing, verified instruments were used as a starting point for the qualitative dataset (Boateng *et al.*, 2018:153). The researcher started by compiling an electronic list of all the assessment items found in the 19 existing instruments. After duplicated items, open-ended questions and biographical questions were removed, the final qualitative dataset consisted of a total of 454 items. In the sorting process the researcher, her supervisor, and an expert in instrument development conducted an inductive content analysis of the existing instruments' items. All existing items were grouped and categorised according to the item statement content (Boateng *et al.*, 2018:153; Hinken, 1995:967). These sorted items formed the dataset for the new instrument (see Figure 3.5).

This dataset of items was grouped according to their content before the groups were rigorously scrutinised. The item contents were then integrated to formulate a new item statement. The researcher ensured that each item strictly adhered to the guidelines for item construction. These guidelines, highlighted by Boateng *et al.* (2018:154); Morgado *et al.* (2017:15); Nemoto & Beglar (2014:3); Grove *et al.* (2013:443); Polit & Beck (2012:355); Botma *et al.* (2010:134) and Ford (2007:7) were applied to ensure the enhancement and quality of the new instrument.

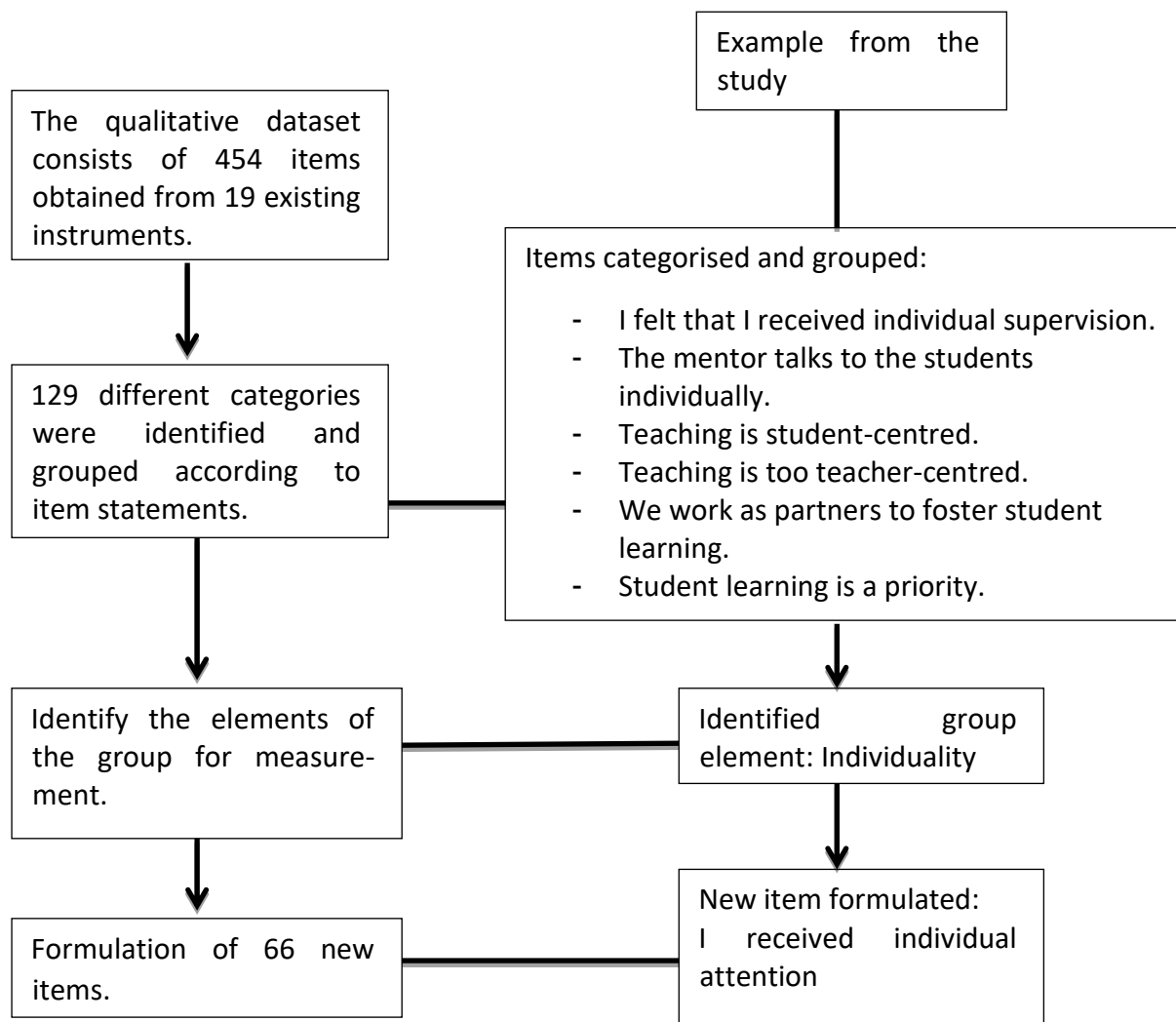


FIGURE 3.4: Flow diagram showing the process of constructing new items

The item construction guidelines include:

- *Clarity of items.* All items should be unambiguous, simply worded, clear and express only a single idea
- *Avoiding jargon.* Cautious attention to terminology that might not be clear to all healthcare students is essential
- *Precluding biased items.* Items should not be offensive or potentially biased in terms of
 - Social identity (statements that prompt respondents to agree with high-status experts)
 - Prestige (statements that appear socially and politically correct)

- Acquiescence (statements that prompt a "Yes" answer)
- *Reasonable length of items.* Short items are best, after eliminating unnecessary words
- *Not using negative words or double negatives.* Negative words or statements lead to misinterpretation
- *Not using leading statements.* Leading statements are items that include emotional language or direct the reader in a specific direction, such as when assumptions are made
- *Avoiding double-barrelled items.* Items that include more than one statement should be avoided. Respondents can only respond to one part of a statement in a Likert instrument
- *Reversing scores.* Reversing scores may be confusing to respondents. A construct reversal may differ fundamentally from the intended meaning.

Some items from the existing instruments were found to already have limitations. The researcher was cautious to prevent repeating such threats. Other items from the prior instruments were found irrelevant as to what the researcher wants to measure this time around, such as "*My other student commitments didn't interfere with my involvement in this placement*" (Anderson *et al.*, 2014:522). As mentioned before, health professional students need to acquire a multitude and variety of skills in the CLE. Thus, any items measuring only a single skill were excluded from the compilation list, for instance: "*I have learned a lot about empathy in my profession*" (Abraham *et al.*, 2008:3). During analysis all items identified as resembling the opinion of someone else were removed as being scientifically immeasurable. An example is "*The preceptor had a good sense of humour*" (Serrano-Gallardo *et al.*, 2016:3). Lastly, any items that measured the HSEI, but not the CLE, such as "*I have great research opportunities in my college*" were also dropped (Sethi & Khan, 2018:361).

Inductive reasoning was implemented in the construction of new items. Declarative statements were used to formulate new concepts. Declarative statements relay information to reflect the concept as fully as possible. If the essential characteristics of individual items are not adhered to, respondents can become less thoughtful when they answer statements, compromising the quality of the measurement.

Therefore items in the instrument were kept simple, straightforward, and follow the patterns of normal conversation.

From this item analysis, the researcher, her supervisor, and the expert consultant formulated sixty-six new items for the first version of the new instrument.

3.5.5 Thematising extracted items

The newly constructed items created a large pool in which four main themes were identified, namely 1) atmosphere and physical environment, 2) teamwork, 3) workload of students and clinical staff, and 4) learning outcomes and opportunities in clinical settings. The final draft instrument contained 66 items. The atmosphere and physical environment of the clinical setting has 17 items, with nine under teamwork in the clinical setting; workloads in the clinical setting consists of five items, and learning outcomes and opportunities comprises of 33 items.

The main focus of clinical learning for healthcare professionals is to provide students with support; an opportunity to learn, and integrate their theory and practice in the CLE. Five biographic questions were included to inquire about the student's age; registered professional course and the year of study; ethnic group, and gender.

The draft instrument was submitted to the Health Science Ethics Committee of the University of the Free State for conditional approval before the second phase could be conducted, accompanied by a list of individual experts who had indicated that they would be willing to participate in Phase 2.

3.6 PHASE 2: FACE AND CONTENT VALIDITY

The validity of an instrument refers to the true measurement of the attributes of concepts (Polit & Beck, 2018:176; Botma *et al.*, 2010:174; LoBiondo-Wood & Haber, 2010:288). Face validity verifies that the instrument appears to measure the content of the study (Grove *et al.*, 2013:694). Although face validity is not considered as

sufficient evidence to establish instrument validity, it contributes to the gradation of validity (Polit & Beck, 2018:176).

Content validity examines the degree to which the measurement method includes all the major aspects relevant to the construct measured (Grove *et al.*, 2013:395). This type of validity determines the degree to which the developed instrument includes all the major elements relevant to the CLE. When the instrument contains all the appropriate items which reflect the CLE is content validity established. The validity of the instrument's content is frequently assessed by a panel of experts that rate the instrument items for relevance to the studied phenomenon and also provide them with the opportunity to comment on the need for additional items (Polit & Beck, 2018:176). The evidence for face and content validation is obtained via the use of a Delphi technique.

3.6.1 Delphi technique

The Delphi technique is a way of soliciting judgment or seeking consensus from experts in which they identify the nature and fundamental elements of the studied phenomenon (Polit & Beck, 2018:222; Grove *et al.*, 2013:435; Balasubramanian & Agarwal, 2012:16). This technique collects data from experts through a set of prudently designed instruments that include summarised information and feedback derived from earlier responses. The Delphi technique has strong features, such as anonymity; iteration; controlled feedback, and a statistical "group response", which increases its credibility (Habibi, Sarafrazi & Izadyar, 2014:8). Several types of Delphi techniques are available for research purposes. Grove *et al.* (2013:435) identified three types of Delphi techniques, namely: Consensus Delphi; dialectic Delphi and decision Delphi. The researcher chose the consensus Delphi technique as being most suitable to obtain items' content validity and judge whether they should be included in the final instrument.

A consensus Delphi technique would generate expert opinions on the content for a new instrument within a structured setting.

3.6.1.1 *Consensus Delphi*

The consensus Delphi focuses on reaching agreement. It consists of a questionnaire sent to a specific group of experts, followed by a second questionnaire based on the feedback from the results of the first. A consensus of 70% is a fair goal to validate the content of the newly developed instrument, as suggested by Humphrey-Murto *et al.*, (2017:18); Falzarano and Pinto Zipp (2013:102) and Hsu & Standford (2007:4). Balasubramanian and Argwal, (2012:17) state that consensus opinions of experts generated through structured circumstances, such as a consensus Delphi technique, can generate a closer estimate of objective truth than could be achieved through conventional methods. The consensus technique also uses respondent's resources (knowledge and experience); commits them to the goal of the study, and enhances the group's ability for future decision-making.

3.6.1.2 *Benefits of Delphi technique*

The Delphi technique is considered appropriate for reaching consensus on a studied subject. One of its strong features is the anonymity between expert panel members. This technique eliminates bias and influences that can occur at face-to-face meetings. The technique allows respondents to react freely, without the effects of dominant individuals, personalities, or group pressure; fear of criticism, and loss of status or field credibility (Waggoner *et al.*, 2016:666; Giannarou & Zervas, 2014:66; Balasubramanian & Agarwal, 2012:21). The use of electronic communication between the researcher and the individual panel members allows the researcher to utilise a geographically dispersed population. Confidentiality is facilitated by a distribution of panel members, and by them not knowing who the other expert panel members are (Balasubramanian & Agarwal, 2012:21; Hsu and Sandford 2007:2). The use of statistical analysis avoids compromised decisions and allows actual consensus of opinions. Multiple rounds provide opportunity to reassess judgments in previous rounds, allowing respondents to thoughtfully modify or change their decisions, and respond when they are ready. The rating of each item through controlled feedback by the entire response group, helps to make the ultimate

conclusion more reliable than during a single meeting (Waggoner *et al.*, 2016:666; Balasubramanian & Agarwal, 2012:21).

Although these benefits are sound, a researcher should also consider the limitations of this technique.

3.6.1.3 *Limitations of Delphi technique*

Limitations in the Delphi techniques are caused by various influences, including the selection of experts. Misjudgement of experts can occur, or an expert may not always be the most knowledgeable person available. Experts may lack a vision of the global picture (Green, 2014:6). High dropout rates cause instability in expert panels. The risk of potential low response rates or expert burnout due to the integral multiple feedback processes and time expenditure is always present (Waggoner *et al.*, 2016:666; Balasubramanian & Agarwal, 2012:21). Other limitations include the possible influence of other experts' responses in previous rounds on the judgment of a panel member, for the sake of consensus. Potential misinterpretation or superficial analysis of responses may lead to important minority issues being overlooked due to pressure to conform (Green, 2014:6; Balasubramanian & Agarwal, 2012:21).

Green (2014:6) states that the Delphi technique is not immune to manipulation, therefore a statistical analysis technique is essential to limit bias. Waggoner *et al.* (2016:666) assert that the success of Delphi techniques depend on the quality of the questionnaire design. Giannarou and Zervas (2014:66) pertinently raise concern about the design of questionnaires used for Delphi, and the selection of the expert panel.

3.6.1.4 *Questionnaire design*

The questionnaire design refers to the choice of Likert scale used and the number of rounds of consensus (Giannarou & Zervas, 2014:66). The purpose of the use of a consensus Delphi technique is to determine the significance of items and whether the items truly describe the CLE.

The researcher had decided to use a three-point scoring instrument for the Delphi technique in Round 1. A three-point scoring instrument provides more than two options, allowing respondents to answer neutrally re items. In Round 1, the experts had a choice between “essential”, “uncertain” and “not needed” items, indicating whether the item under investigation should be included in the final instrument or not. If an expert wanted to motivate a choice, space for comments was provided (see Addendum C1). A three-point instrument assesses the level of agreement and demonstrates the variety of expert opinions effectively. The majority of consulted research had indicated that consensus could be reached after two to three rounds (Giannarou & Zervas, 2014:68). Therefore the researcher would continue the rounds until there was consensus for inclusion or exclusion of all the items in the instrument. The draft instrument was addressed electronically to the experts to confirm the face and content validity and relevance of items.

The first round of the Delphi technique serves as the cornerstone for asking specific information about the content of the intended instrument. Three biographic questions accompanied Round 1’s questionnaire. The biographic questions were chosen to inform the researcher more about a respondent's clinical expertise. The questions included the following: 1) Indicate your highest professional qualification; 2) Indicate your number of years’ experience in the CLE, and 3) Indicate the total number of hours spent with students per week in the CLE.

After receiving the responses, the information was converted into a second round questionnaire of first round responses. For the second round, the researcher decided to use a dichotomous instrument, which is a two-point instrument that presents choices that are the absolute opposite to each other. With the second round, the researcher sought a clear decision from the experts, without a possibility of staying neutral. The experts could choose “yes” for item inclusion and “no” for exclusion. This type of response instrument does not allow the respondent to remain neutral. The questionnaire was again redistributed electronically to the panel of experts. The experts were again asked to review the summarised items based on the feedback received from the first round. The final number of Delphi iterations

would depend on the degree of consensus pursued by the researcher from the selected group of experts.

A third round became necessary whereby the experts were asked to revise or review their judgment, or to specify the reasons for remaining outside consensus (Balasubramanian & Agarwal, 2012:19). Subsequently, the study's biostatistician reviewed the newly developed instrument to determine if it was appropriate for statistical analysis. The Delphi instrument, together with the directory of expert panellists was then submitted to the Faculty of Health Sciences' Ethics Committee at the University of the Free State for final approval [UFS-HSD 2019/0284/3007]. (See Addendum A2 for the approval letter).

3.6.1.5 *Population of the Delphi technique*

The population of a research study refers to individuals that meet certain criteria for inclusion from a given universe (Polit & Beck, 2018:162; Grove *et al.*, 2013:44). The population health science professionals, including biokineticists; dieticians; dentists; nurses; occupational therapists; optometrists; paramedics; physiotherapists; medical physicians; pharmacists and radiographers. These health science professionals represent the population of students the new instrument is intended for.

As indicated, one of the most important phases of the Delphi technique lies in the selection of the expert panel. The choice of panel members directly influences the quality of the results (Balasubramanian & Agarwal, 2012:20; Hsu & Sandford, 2007:3). The validity of the results depend on the competence and knowledge of the panel members (Habibi *et al.*, 2014:10). An expert is a person who is competent, knowledgeable, and has experience in the specialised area related to the phenomenon that is being studied. In this case, that would be the healthcare sector's CLE. Individuals were considered eligible for participation in the study if they had related healthcare backgrounds and experience; were thought capable of contributing helpful inputs, and were willing to revise an initial or previous judgment to attain consensus (Hsu & Sandford, 2007:3).

Studies recommend that the researcher choose appropriate experts through a nomination process from institutions and other well-known and respected individuals (Giannarou & Zervas, 2014:67; Hsu & Sandford, 2007:3). Purposive selection and then snowball sampling would allow the researcher to identify experts from the CLE to measure the instrument.

The following steps of the selection criteria were followed:

- Identifying the various relevant categories of experts
- Populating the selected categories with the actual names of potential experts
- Ranking the experts based on their qualifications and experience (for example, holding a health science Bachelor's degree with at least five years' professional clinical experience; specialising in either education, clinical accompaniment, or supervision of students in the CLE)
- Inviting the experts to join the panel.

Representation of content validity is assessed by the qualities of the expert panel, rather than its numbers (Thangaratinam & Redman, 2005:120). An appropriate population has to be selected to institute content validity. The researcher therefore invited an extensive number of experts in the field of healthcare to participate, as high attrition rates are known to be associated with Delphi techniques (Green, 2014:6). (See Addendum D for the expert panel list). Giannarou and Zervas (2014:67) state that a sample of at least twenty panellists tends to retain its members. Other researchers' recommend between 10 and 15 respondents as being sufficient to ensure validity (Waggoner *et al.*, 2016:664; Giannarou & Zervas, 2014:67; Falzarano & Pinto Zipp, 2013:100). Eligible experts would include people from different specialties who have background knowledge and experience in the CLE, and are willing to participate in the Delphi technique. Experts were identified based on their fit within predefined criteria.

The population for the Delphi technique was selected via purposive selection and snowball sampling.

3.6.1.6 Sampling

Sampling is a process of selecting elements that represent an entire population so that conclusions about the population can be made (Polit & Beck, 2018:51). The researcher chose to use non-probability sampling to select expert healthcare professionals for the Delphi panel. In non-probability sampling, respondents are selected by random methods (Grove *et al.*, 2013:362). A sample in quantitative research should possess two key considerations, namely representation of the population and the size of the sample (Polit & Beck, 2018:166). The researcher decided on using a two-step sampling method. The first step purposively selected experts, and the second step applied snowball sampling.

Purposive selection of experts is based on using the researcher's knowledge about the population to select sample members (Polit & Beck, 2018:164; Grove *et al.*, 2013:365). In this case the researcher purposively selected professionals who are knowledgeable about the CLE's of health professional students. Purposive selection is often used when researchers want a sample of experts to participate in a Delphi technique (Polit & Beck, 2018:164). The individual expert respondents for this study were selected by applying specific criteria selection, and identifying those who fit the best. They were then contacted via email, in compliance with the pre-defined criteria of electronic communication, and were asked to evaluate whether they felt that they fit into the set criteria, and to indicate their possible interest in participating in the study. To conform to the requirement of representativeness of health professions, the researcher compiled a list of all the health science professions that place their students in a CLE for WIL. At least three respondents from a health science profession were regarded as an ideal representative sample from the population. In the email, the respondents were also asked to refer the researcher to other professionals who met the pre-defined criteria. This is known as snowball sampling.

Snowball sampling is a variant of convenience sampling (Polit & Beck, 2018:199). This sampling method is often used when the population consists of people with characteristics difficult to pinpoint (Polit & Beck, 2018:199). Additional experts were identified with the help of the initially selected study respondents.. The strategy of peer referral made it possible to identify a diverse group of expert professionals from various backgrounds. The researcher emailed the pre-defined criteria to the newly-referred healthcare professionals and asked for their consideration to participate in the study.

At final count, the researcher had invited a total of 54 healthcare experts to respond. Of the 54 invitations, 18 did not consider themselves expert, based on the pre-defined criteria. These individuals, who no longer met the pre-defined criteria, were removed from the list of possible experts, leaving 36 professionals who agreed to respond. (See Table 3.4 for a summary of matrix criteria for the Delphi panel).

TABLE 3.4: Summary matrix of criteria for Delphi panel

Health science profession	Participant	Country	Health Science Bachelors' or higher degree	Years of professional clinical experience (min 5 years)	Clinical accompaniment or supervision of students in CLE	Willing to participate in all rounds
Biokineticist	Participant 1	South Africa.	X	X	X	X
	Participant 2	South Africa	X	X	X	X
	*Participant 3	South Africa	X	X	X	X
Dentist	Participant 4	Nigeria	X	X	X	X
	Participant 5	South Africa	X	X	X	X
	*Participant 6	South Africa	X	X	X	X
Dietitian	Participant 7	Lesotho	X	X	X	X
	Participant 8	South Africa	X	X	X	X
	*Participant 9	South Africa	X	X	X	X
Nurse	Participant 10	South Africa	X	X	X	X
	Participant 11	Uganda	X	X	X	X
	Participant 12	South Africa	X	X	X	X
	Participant 13	South Africa	X	X	X	X
	Participant 14	South Africa	X	X	X	X
Occupational therapist	Participant 15	South Africa	X	X	X	X
	*Participant 16	South Africa	X	X	X	X
	Participant 17	Nigeria	X	X	X	X
	*Participant 18	South Africa	X	X	X	X
Paramedic	Participant 19	South Africa	X	X	X	X

Health science profession	Participant	Country	Health Science Bachelors' or higher degree	Years of professional clinical experience (min 5 years)	Clinical accompaniment or supervision of students in CLE	Willing to participate in all rounds
	Participant 20	South Africa	X	X	X	X
	*Participant 21	South Africa	X	X	X	X
Optometrist	Participant 22	South Africa	X	X	X	X
Physio-therapist	Participant 23	Rwanda	X	X	X	X
	Participant 24	South Africa	X	X	X	X
	*Participant 25	South Africa	X	X	X	X
	*Participant 26	South Africa	X	X	X	X
Medical physician	Participant 27	South Africa	X	X	X	X
	Participant 28	Uganda	X	X	X	X
	*Participant 29	South Africa	X	X	X	X
	*Participant 30	South Africa	X	X	X	X
	Participant 31	Uganda	X	X	X	X
Pharmacist	Participant 32	South Africa	X	X	X	X
	*Participant 33	South Africa	X	X	X	X
	*Participant 34	South Africa	X	X	X	X
Radiographer	Participant 35	South Africa	X	X	X	X
	Participant 36	South Africa	X	X	X	X

Table 3.4 represents the 36 respondents who had indicated their participation in the study after the snowball sampling was done. Those respondents with an asterisk sign (*) indicate the respondents that were included due to the snowball sampling. Eleven health science professions were included in the sample. The researcher's goal was to sample at least three participants per profession to represent that profession. After feedback was received from all the experts invited, the researcher was left with only one optometrist respondent and two radiographer respondents. Due to the timeframe of the study, the research team decided to continue with the study with the smaller number of representatives for two of the health science professions. The final respondents represent the whole Southern African continent. Twenty-nine of the respondents represented South Africa, and seven are international experts from other African countries. A total of 36 respondents were included in the matrix criteria. Of those, 22 responded in the first round, representing a 61% response rate.

3.6.1.7 *Data collection*

The data collection process obtains information from experts in answer to the research problem. In quantitative research, the data capture is numerical (Grove *et al.*, 2013:45). A 70% consensus rate was sought for the items on the newly drafted CLE assessment instrument. The step of data collection followed a standardised process to minimise potential problems.

A researcher must obtain informed consent before data is collected. An informed consent letter was sent electronically to the experts with the first draft of the instrument (see Addendum B). By completing and submitting the questionnaire, the experts consented to participate in the Delphi study. No signatures were thus obtained from the expert panellists.

Data collection was completed over a three month period, which delivered three rounds of results. The first draft instrument was sent to the experts electronically (see Addendum C1) during Round 1. The experts had to evaluate face validity and to appraise each item on the instrument, using one of three headings: "Essential";

“Uncertain”, or “Not needed”. The researcher had provided space for experts to add any comments, e.g. elements of CLEs which they felt were missed in the draft instrument. They were initially assigned a deadline of two weeks for completion, with one electronic reminder being sent halfway. The time was extended another week due to feedback from the experts. The researcher received 22 completed questionnaires during the first round. The data, summarised in percentages and items that still required consensus in the second round, were captured on a specially designed Microsoft® Excel spreadsheet. A biostatistician recalculated and verified the conclusions from each round.

The second round of the Delphi study included the nine items which had been left inconclusive in the first round, lacking the 70% consensus rate required. The second round provided feedback on the first round, and a new questionnaire with the nine items was sent electronically to the experts for re-judgement (see Addendum C2). Within a deadline of two weeks, the panel again needed to measure items for inclusion or exclusion, with one halfway reminder being sent automatically. Sixteen completed questionnaires were submitted in the second round. The data was also captured on the Microsoft® Excel spreadsheet.

After the first two rounds in the Delphi study were completed, five items still had not achieved consensus. These five items were resent electronically to the experts for a final judgement (see Addendum C3). Nine experts submitted the final questionnaire. A tenth questionnaire, received back after the deadline had expired and but before the Delphi project had concluded, was included in the study. Two items had been left without the 70% consensus rate after the third round. These two items were excluded due to inconclusiveness, and the appropriate changes were made to the final instrument.

The final instrument will be subjected to further testing in the future, but that process does not form a part of this research study.

3.6.1.8 *Data capturing and cleaning*

Data capturing and cleaning refers to the preparation of data for analysis by checking whether data are consistent and accurate (Polit & Beck, 2012:725). Each questionnaire was assigned an identification number. Under supervision of the researcher, an assistant with research background captured the data on the Microsoft® Excel spreadsheet after each round. The Excel spreadsheet underscored those items that did not meet the 70% consensus rate. Subsequently, the researcher and supervisor checked and verified the captured data for consistency and accuracy, by comparing it to the questionnaires received from the experts. No mistakes were noted during the verification processes.

3.6.1.9 *Data analysis*

Data analysis is defined as the organising and synthesis of research data (Grove, *et al.*, 2013:46; Polit & Beck, 2012:725). The data analysis process gave depth of meaning and perspective on the feedback from the experts. The feedback was statistically analysed and conclusively captured as percentages and descriptive statistics by the researcher, for final verification, the data was forwarded electronically to the biostatistician at the Department of Biostatistics of the University of the Free State. As suggested by Humphrey-Murto *et al.* (2017:18); Falzarano and Pinto Zipp (2013:102), and Balasubramanian and Agarwal (2012:21), the minimum 70% for the consensus inclusion criteria was retained.

3.7 ETHICAL CONSIDERATIONS

To ensure that all the ethical aspects of the study had been considered, approval for the second phase or research had to be obtained from the Faculty of Health Sciences' Ethics Committee at the University of the Free State.

Three ethical principles that must be under consideration when conducting a research study would include respect for people; beneficence and non-maleficence, and distributive justice (Polit & Beck, 2018:79; Botma *et al.*, 2010:17). The second research phase included collecting the opinions of expert healthcare practitioners, therefore the researcher made sure to comply with the National Department of Health's key norms and standards (2015:14) for performing research with people. The DoH key norms and standards are based on ethical principles, and focus on the relevance and value of the study; scientific integrity; role-player engagement; favourable risk-benefit ratio; fair selection of respondents; informed consent; ongoing respect for enrolled respondents, and research competence and expertise. These values were considered throughout implementation of the study.

3.7.1 Relevance and value

Meaningful research should be essential, relevant and responsive to the needs of the people, and improve standards and well being (DoH, 2015:15). The outcome of this study generated a new, more applicable instrument, able to comprehensively measure the aspects of CLEs. A new instrument would enable HSEIs to select clinical settings with the appropriate CLE for their students' work-integrated learning. Good quality clinical learning will promote students' competence, and subsequently improve people-centred care.

3.7.2 Scientific integrity

A study's design and methodology are vital to its research integrity. Sound design and methodology result in reliable and valid outcomes, while poor design and inappropriate methods may expose respondents to unnecessary risk and harm (DoH, 2015:15).

This study was approved by an evaluation committee from the University of the Free State's School of Nursing before it was sent to the Health Science Research Ethics Committee for ethics approval. After receiving the Committee's study authorisation, the researcher was reassured that the study was judged to be sound and correct,

based on fellow-researchers' review and approval. A biostatistician evaluated the progress of the instrument and resulting data. Last of all, the researcher had done the study under the supervision of her supervisor who has used this methodology before, and had published articles on the topic.

3.7.3 Role player engagement

To ensure the quality and rigour in a study, key experts should be involved throughout the various stages of the process (DoH, 2015:15). The researcher made use of a trained librarian to hunt for any existing relevant and reliable literature and instruments on the subject of CLEs. The supervisor and an expert instrument developer assisted with item construction. Engagement of relevant role players means that key experts were involved in a Delphi technique to assist with the confirmation of the face and content validity of the new instrument.

The relevant experts which had been identified earlier were invited to participate via email (refer to the discussion on the selection of panel experts). The email provided the experts with a full description of the nature of the research; the identifying criteria set out for selecting an expert, and enquired whether they would be interested in participating in the Delphi study. Only potential experts who complied with the set criteria, and all who indicated their interest in participating received a second email describing the experts' expected responsibilities, as well as any possible risks or benefits for participating in the study (Polit & Beck, 2012:154). The expected expert responsibilities included careful and honest appraisal of the suggested CLE-relevant items and themes in the instrument, as well as commitment to participate in the series of feedback rounds until consensus of opinion was reached.

3.7.4 Favourable risk-benefit ratio

The principle of favourable risk-benefit ratio is grounded in the right of research participants to be protected from any harm or discomfort (Brink *et al.*, 2012:36; Botma *et al.*, 2010:20). In this study, no direct risks to the experts were identified. It was explained to the experts that their participation would benefit the researcher, helping to ensure the face and content validity of the newly developed CLE measuring instrument for future healthcare students. The experts themselves might not benefit directly from this study, but indirectly, future healthcare students and healthcare professions would reap the rewards. The study involved no undue costs, and no remuneration was offered for participation.

The researcher had not foreseen any discomfort to the participating experts, except expertise and the time needed to complete the instrument more than once. The first round was anticipated to require twenty minutes for an expert judgement, while the second to final rounds of the Delphi study were estimated to each need five minutes professional time. Finally, the study's results may be published in a number of scientific journals, and be used for conference proceedings.

3.7.5 Fair selection of participants

Fair selection of participants is required to be unbiased, reasonable, and based on sound scientific and ethical principles (DoH, 2015:15). Purposive selection and snowball sampling methods were used to select the participants, known as clinical experts in this study. The researcher had prepared selection criteria to identify clinical practitioners who are pertinent and suitable experts in their fields of study. As the experts represent the health science community, they therefore had to be knowledgeable about the CLE. The selected experts were contacted via email. If they did not fit the set criteria, or were not interested in participating in the Delphi technique, they were asked to recommend suitable alternative professional experts from the study field.

3.7.6 Informed consent

Participation in this study had to be voluntary and based on an informed choice (DoH, 2015:15). Prior to participation, information about the study was communicated to the suggested expert members via electronic information leaflet (Addendum B). The respondents had the right to decide whether they wanted to participate in the study or not, and were informed that they could stop or withdraw from the study at any time without any negative consequences (Polit & Beck, 2018:83). As far as possible, all uncertainties were clarified in the email, prior to participation. The selected participants had a short period of time to respond to the invitation to voluntarily be part of the study. Only participants who had shown interest in participating were included in the Delphi panel.

Privacy and confidentiality takes centre stage when a number of respondents are drawn into a Delphi study. This is achieved when there are no identifiable links between expert respondents and their submitted responses (Polit & Beck, 2018:84; Botma *et al.*, 2010:17). The privacy of the experts was further ensured by the direct submission of their electronic judgements to the researcher. The information leaflet also contained contact details of the Health Science Research Ethics Committee, should a respondent want to lodge a complaint, e.g. if they felt they had been treated unfairly. By completing and submitting the draft CLE assessment instrument to the researcher, the clinical experts agreed that they had read and understood the terms and conditions of the research, and that they consented to participate in this study.

3.7.7 Ongoing respect for enrolled respondents

Respondents have a right to privacy and confidentiality (DoH, 2015:15). Responses received were dealt with in a confidential manner. The researcher collectively summarised the feedback from all of the respondents for the next round, so that no individual could be identified. Confidentiality was maintained, as only the research team directly involved in the study had access to information re the respondents. Data were safely stored on an external hard drive until the researcher had finalised

the report. Electronic data was stored on a flash drive in a locked steel cupboard in the researcher's office, with limited access. The researcher processed the raw data herself, and the supervisor validated the results. Data will be kept for a minimum of 15 years, as per University Ethics guidelines.

3.7.8 Research competence and expertise

The researcher and the supervisor are both suitably qualified and technically competent to carry out the research study (DoH, 2015:16). Lastly, the researcher functioned under the full-time supervision of a qualified supervisory researcher from the field of study. The supervisor was also responsible to ensure that the researcher followed the approved protocol for maintaining the integrity of the study (DoH, 2015:16). These are the essential norms and standards which guided all ethical considerations in this study.

3.8 SUMMARY

In this chapter, the scientific research process was described. A positivist paradigm was identified as being influential in this study subject. The CLE is believed to be measurable; therefore the researcher advocated using the positivism approach for quantitative research methods. Quantitative methods follow a prescribed, objective, systematic approach to investigate phenomena that require precise measurement.

An improved instrument was needed to measure the CLE for health professional students. The researcher followed a methodological research process to develop such an instrument, able to measure CLEs for healthcare requirements. The methodological research process was conducted in two phases. During Phase 1, the researcher completed a general literature overview securing existing measuring instruments; a thematic analysis of the items, followed by compilation of the first version of the instrument. In this methodological research process, the population was described as the students the instrument was intended for, namely health professional students placed in the CLE for WIL.

In Phase 2 the researcher explored the face and content validity of the newly compiled instrument. Face and content validity was determined by Delphi technique. The Delphi technique required an expert panel to judge the substance of the newly developed instrument. As this population had to fit the pre-determined criteria, it was selected in two stages. In the first stage, the researcher use purposive selection, followed by snowball sampling. The experts included healthcare professionals who work with students in a CLE. A second version of the instrument was finalised after face and content validity was confirmed by the panel. A full description of the type of instrument that was developed has been provided.

Finally, full descriptions of the data collection process to gather quality data; the capturing and cleaning of data, and the data analysis have been provided. To protect participating individuals against any possible physical or psychological harm during the study, the researcher has accounted for the required ethical research considerations.

As testing the instrument is not part of this study, Phase 3 of the process was omitted. These three phases concluded the methodological research process.

In Chapter 4 the results of the data collected during the Delphi technique will be discussed.

CHAPTER 4

Data analysis of the Delphi study

4.1 INTRODUCTION

In Chapter 3 the methodology of this study was explained. As already mentioned, the study was executed in two phases. Phase 1 included a general overview of the existing literature; available instruments items and was discussed in Chapter 2, while the securing of existing instruments and the thematic analysis of items from the retrieved instruments was discussed in Chapter 3. The first version of the new CLE measurement instrument was then compiled.

Phase 2 comprised assessment of the face and content validity of the new instrument with a Delphi study, which will be elaborated on in this chapter. This chapter also deals with the findings from the data collected during Phase 2. As described in Chapter 3, the researcher chose to run a Consensus Delphi study in an effort to achieve a 70% consensus for identifying items for inclusion in the new instrument. Application of the Delphi method; the selection of expert participants; study construction, and the administration of the Delphi instrument have already been noted and discussed in Chapter 3.

Chapter 4 deals with the findings stemming from the Delphi study, as well as conclusions drawn on the face and content validity of the new instrument.

4.2 RESPONDENTS

Purposive selection and snowball sampling allowed the researcher to identify CLE subject experts. Fifty-four experts were invited to participate in the Delphi study. Initially, a total of 36 experts who met the inclusion criteria indicated their interest in participation (see Table 4.1). However, in Round 1 only 22 responded, of whom only 16 respondents in Round 2. In the last and final round only 10 of the expert panel

members responded. According to the literature, 10 respondents are sufficient to ensure both face and content validity for a Delphi study (Waggoner *et al.*, 2016:664; Giannarou & Zervas, 2014:67; Falzarano & Pinto Zipp, 2013:100). The researcher believes that the response rate is low due to the timing of the 2020 data collection. This had to be done at the height of the first surge of the CoVID-19 pandemic, and the selected clinical respondents were all frontline healthcare professionals during the pandemic. Table 4.1 provides a summary of the expert panel members, including the criteria for their selection; the expert panel members' professions; the total number of years' experience of each in the field of study; their highest vocational qualification(s), and the total average time spent with students in the CLE. Although the summary includes all 36 panel members, only the 22 experts that participated during Round 1 enclose the full description. Four of the 22 (18.2%) participants who responded in Round 1 were from the international community, while 18 (81.8%) were South-African professionals.

TABLE 4.1: Criteria for Delphi panel

Expert panel members	Criteria to qualify as an expert panel member				Profession	Country	Highest professional qualification	Number of years' experience in the CLE	The total number of hours spent per week with students in the CLE.
	Health Science Bachelor or higher degree	Years of professional clinical experience (min. 5 years)	Clinical accompaniment or supervision of students in the CLE	Willingness to participate in all rounds					
Panel member 1	X	X	X	X	Biokineticist	South Africa.			
Panel member 2	X	X	X	X	Biokineticist	South Africa			
Panel member 3	X	X	X	X	Biokineticist	South Africa			
Panel member 4	X	X	X	X	Dentist	Nigeria	PhD	5	>6 hours
Panel member 5	X	X	X	X	Dentist	South Africa	PhD	15	>6 hours
Panel member 6	X	X	X	X	Dentist	South Africa			
Panel member 7	X	X	X	X	Dietitian	Lesotho			
Panel member 8	X	X	X	X	Dietitian	South Africa	Masters	14	>6 hours
Panel member 9	X	X	X	X	Dietitian	South Africa	PhD	22	2-6 hours
Panel member 10	X	X	X	X	Nursing	South Africa	Masters	11	>6 hours
Panel member 11	X	X	X	X	Nursing	Uganda			
Panel member 12	X	X	X	X	Nursing	South Africa			
Panel member 13	X	X	X	X	Nursing	South Africa	Masters	8	>6 hours

Expert panel members	Criteria to qualify as an expert panel member				Profession	Country	Highest professional qualification	Number of years' experience in the CLE	The total number of hours spent per week with students in the CLE.
	Health Science Bachelor or higher degree	Years of professional clinical experience (min. 5 years)	Clinical accompaniment or supervision of students in the CLE	Willingness to participate in all rounds					
Panel member 14	X	X	X	X	Nursing	South Africa			
Panel member 15	X	X	X	X	Occupational therapist	South Africa	Masters	16	30 min-2 hours
Panel member 16	X	X	X	X	Occupational therapist	South Africa	Masters	14	>6 hours
Panel member 17	X	X	X	X	Occupational therapist	Nigeria	PhD	11	>6 hours
Panel member 18	X	X	X	X	Occupational therapist	South Africa	PhD	24	>6 hours
Panel member 22	X	X	X	X	Optometrist	South Africa	PhD	15	2-6 hours
Panel member 19	X	X	X	X	Paramedic	South Africa			
Panel member 20	X	X	X	X	Paramedic	South Africa			
Panel member 21	X	X	X	X	Paramedic	South Africa			
Panel member 23	X	X	X	X	Physiotherapist	Rwanda	PhD		>6 hours
Panel member 24	X	X	X	X	Physiotherapist	South Africa	Masters	10	30 min-2 hours
Panel member 25	X	X	X	X	Physiotherapist	South Africa	Masters	34	>6 hours
Panel member 26	X	X	X	X	Physiotherapist	South Africa	Masters	14	>6 hours
Panel member 27	X	X	X	X	Medical physician	South Africa			

Expert panel members	Criteria to qualify as an expert panel member				Profession	Country	Highest professional qualification	Number of years' experience in the CLE	The total number of hours spent per week with students in the CLE.
	Health Science Bachelor or higher degree	Years of professional clinical experience (min. 5 years)	Clinical accompaniment or supervision of students in the CLE	Willingness to participate in all rounds					
Panel member 28	X	X	X	X	Medical physician	Uganda			
Panel member 29	X	X	X	X	Medical physician	South Africa			
Panel member 30	X	X	X	X	Nursing working with medical physician students	South Africa	Masters	40	>6 hours
Panel member 31	X	X	X	X	Medical physician	Uganda	PhD	16	>6 hours
Panel member 32	X	X	X	X	Pharmacist	South Africa	Bachelors	3	30 min-2 hours
Panel member 33	X	X	X	X	Pharmacist	South Africa	Masters	3	2-6 hours
Panel member 34	X	X	X	X	Pharmacist	South Africa	Masters	13	>6 hours
Panel member 35	X	X	X	X	Radiographer	South Africa	PhD	30	2-6 hours
Panel member 36	X	X	X	X	Occupational therapist	South Africa	Masters	12	>6 hours

4.2.1 Professional data

Three questions were asked in the biographical section of the study to obtain more information about the expert panellists. The questions included their highest professional qualification, their number of years' experience in the CLE and the total number of hours they spent per week with students in the CLE.

Capturing the respondents' professional data is important as a research study always strives to ensure representation of the whole population group, which in this case are health science professionals. Initially, the researcher attempted to include all the major health science professions to ensure good representation of all the different types of healthcare vocations. A total number of 22 respondents participated in the first round of the Delphi study. The profession with the highest number of respondents was occupational therapy, with five of the 22 (22.7%) respondents. The second highest number of professionals was physiotherapy, comprising of four of the 22 respondents (18.2%). Sadly, none of the biokineticists or paramedics respondents took part in Round 1. Special attention will be given to these professions when the instrument undergoes further testing in the future. Despite the absence of responses from biokinetics and paramedic professionals, all the other professions were represented by one or more respondents in Round 1, namely dentistry; dietetics; nursing; optometry; medical physicians, pharmacology and radiography. The population was fairly evenly distributed among the different health sciences. In Round 2, 16 experts participated and the representation remained reasonably well distributed, although no dieticians participated in this round. Round 3 concluded with 10 participating experts. Excepting for the larger number of nurses, representation was still evenly divided between the remaining professions.

4.2.2 Highest professional qualification

The researcher considered the level of the experts' professional qualifications to be of importance in this study, as it reflects the level of discrimination and learning that could be provided by them. All 22 respondents held at least a Bachelor of Sciences'

degree or a higher qualification. The Master's degree had the highest representation among the respondents, with a total of 12 (54.5%) respondents holding this qualification. Nine of the 22 (40.9%) respondents had a Ph.D. degree. Only one respondent held a Bachelor's degree as the highest qualification (4.5%). The final number and levels of qualification ensured that the panel members were all professional healthcare practitioners, which is what the researcher was aiming at.

4.2.3 Number of years' experienced in the CLE

Even if the expert panel members were in possession of the highest professional qualifications, their number of years' clinical experience and their current expertise in the field of study played the major role in their selection. The field of study is the CLE of all health professional students. Therefore, the panel members' number of years' experience in the clinical learning environment (CLE) is important to determine their proficiency. The total number of years' experience of the respondents in Round 1 ranged between 03 - 40 years, with an average of 15.7 years, with a standard deviation of 9.6 years per expert.

4.2.4 Total number of hours spent per week with students

The researcher provided the respondents with three answer options as to the total number of hours they spent per week with students. It was important to identify precisely how involved the experts were with student learning or accompaniment in the CLE before asking them to determine the most important factors in their CLEs. The three options were 1) Between 30 min. – 2 hours per week; 2) between 2-4 hours per week, and 3) > 6 hours per week. Fifteen (68.2%) of the respondents indicated that they spent more than six hours per week with students in the CLE. Only three experts (13.6%) spent between 30 minutes to two hours per week with students in the clinical setting. The rest of the respondents (18.2%) spent an average of two to six hours per week with students in the CLE. Consequently, the researcher was of opinion that the selected experts spent a sufficient number of hours with students in the field of study to enable them to respond with credibility to the Delphi research questions.

4.3 CLARIFYING THE FOCUS OF THE INSTRUMENT

As explained in Chapter 3, the Delphi instrument is divided into five sections. The first section included the biographical data of the respondents, while the second to fifth sections focused on elements of the CLE. The purpose of this Delphi technique was to determine the face and content validity of the new instrument by establishing the relevance of each included item according to the experts' opinion. The second section of 18 items covered the element of atmosphere in the clinical setting. The third section referred to nine items covering teamwork in the clinical setting. Five items from the fourth section refer to workload in the clinical setting. The last 34 items in the final section of the instrument focuses on learning opportunities in the clinical setting.

These sections and their relevant items will be analysed and discussed in detail in the rest of this Chapter.

4.4 PROCEDURE FOR THE ADMINISTRATION OF THE DELPHI INSTRUMENT

As mentioned in Chapter 3, the Delphi instrument was emailed to the 36 respondents described in Table 4.1, who then completed the instrument electronically during each round, and submitted it to the researcher. In the email correspondence at the start of each round, the researcher provided a clear and detailed explanation of the instrument, as well as how the respondents were to denote their responses (see Addendum B). A 3 – point Likert instrument was used for Round 1, which the researcher changed to a dichotomous instrument for Rounds 2 and 3. As the respondents already responded with their opinions and concerns during Round 1, the researcher only left them with a choice of “Yes” or “No” in the last two rounds. Although the format of the instrument had changed, the format of the items themselves remained consistent across the three rounds. The researcher only removed items where a 70% or higher consensus had been reached in the

prior round to make it easier for the respondents to provide feedback in the next rounds.

4.5 FORMAT OF THE INSTRUMENT AND PRESENTATION OF RESPONSES

4.5.1 Format of the instrument

In the first version instrument, space for comments was created next to each of the items in the sections on the atmosphere; teamwork; workload, and the available learning opportunities in the clinical setting. Respondents were required to indicate their response to individual items as being either:

3 = Essential [for inclusion in the new instrument]

2 = Uncertain

1 = Not needed

During the second and third dichotomous rounds the required response would be either a “Yes” (= 3) for item inclusion, or “No” (= 1) for item exclusion.

4.5.2 Analysis and presentation of responses

No psychometric properties such as standards deviation etc. was tested further as the aim of the instrument was to measure its face and content validity through the inclusion or exclusion of items.

According to Balasubramanian and Agarwal (2012:16), and Waggoner *et al.* (2016:665), the Delphi technique is defined as “a method for achieving consensual agreement among expert panellists through repeated iterations of confidential opinions and feedback derived from earlier responses.” In this study, the Delphi technique was used to obtain a constructive result (face and content validity) by selecting experts and structuring an instrument for communication purposes. A Delphi technique is characterised by several repeating rounds. The first round

involves the initial exploration of the content of the intended items. The second round provides the opportunity for respondents to reach understanding on how the group views the issue. A third round would be indicated should the experts be asked to revise their judgment, or to specify reason(s) for remaining beyond consensus (Balasubramanian & Agarwal, 2012:19). Reviewed studies forecast that during the use of a Delphi technique, diminishing returns would be usual in each of the various rounds (Balasubramanian & Agarwal, 2012:21; Hsu & Sandford, 2007:5; Thangaratinam & Redman, 2005:122). In this study, an increased rate of attrition of participating expert panel members was noted as the rounds repeated.

The Delphi technique in this study consisted of three rounds. The total number of participating respondents declined from 22 respondents in the first round to 16 respondents in the second round, leaving only 10 respondents in the third round. After each round, the researcher analysed the responses from each of the panel members. Chapter 3 describes the Delphi technique as a quantitative methodology, where the researcher aims to obtain consensus from the expert panel members. As recommended by several authors, consensus is assumed to exist when there was a 70% or greater agreement rate between panel members as recommended by several authors (Humphrey-Murto *et al.* 2017:18; Falzarano & Pinto Zipp 2013:102, Hsu & Sandford, 2007:4). Consensus was furthermore only calculated on the total number of respondents in each round. Therefore, in Round 1, there were 22 respondents. Consensus was assumed to have been achieved when at least 16 of the 22 respondents all chose the same option. When the sum of "Essential" or "Not needed" responses, including the neutral choice, was calculated at more than 70%, the item routed to the second round. If the sum was less than 70% consensus, the item removed from the instrument due to stability of responses reached. Although the respondents had an opportunity during Round 1 to add comments, or voice their opinion on any new items found lacking on the instrument, no new items were eventually added.

In the second and third dichotomous instrument rounds, the expert panel members were required to make their decisions based on feedback from the previous rounds. The researcher also clarified items that had previously not achieved consensus in the feedback report to the respondents (see Addendum C2 and C3).

The researcher chose to make use of a colour coding system for presenting and discussing the response to each of the items:

Items highlighted in **Grey** were those that had achieved sufficient consensus during Round 1, as described.

Items highlighted in **Yellow** indicated that consensus was achieved after Round 2.

Items that achieved consensus during the third and final round were highlighted in **Green**.

Items that remained stable and / or where consensus could not be reached after all three rounds were left in plain text.

A “Results Column” reflected the final selections made by each of the panel members, including the majority choice and percentage(s) of agreement.

4.6 RESPONSES TO THE ATMOSPHERE IN THE CLINICAL SETTING

This section contained 18 items, focusing on exploring the experts’ opinions regarding the substance of the atmosphere in a clinical setting that could / may not contribute to the clinical learning environment (CLE). The following discussion will present the panel’s responses to each of the items regarding the atmosphere of a clinical setting.

4.6.1 Welcoming effect in the unit

Item		Essential	Uncertain	Not needed	Responses
1	I was welcomed to this unit.	3	2	1	Round 1: (3) 77%; (2) 13%; (1) 10%

Comment: A 77% consensus rate was achieved during Round 1, with 17 of the 22 respondents agreeing that when students are welcomed to the clinical setting, it contributes to an atmosphere that is conducive to clinical learning. Two respondents indicated that this item was not needed, while three respondents were uncertain whether this item was relevant to the questionnaire. This mostly consensual finding is supported by the literature overview, stating that a welcoming experience in the clinical environment is promoted when the professional staff anticipates students' arrival, greet, and introduce them to other team members (Botma & Mackenzie, 2016:108; Chuan & Barnett, 2012:192).

4.6.2 Orientation to the physical environment

Item		Essential	Uncertain	Not needed	Responses
2	I was orientated to the physical environment	3	2	1	Round 1: (3) 95.5%; (2) 4.5%

Comment: The majority of the expert panel (95%) was in agreement during Round 1 that orientation to the physical environment is important in contributing to a positive CLE. Only one respondent was uncertain whether the item should be included when measuring the CLE. The researcher supports orientation to the clinical environment, with focus on where to find what; the routine of an average day; documentation that students are expected to complete, as well as expectations regarding all the clinical activities the students will be performing. Orientation

contributes to a student's sense of belonging in a new environment. He / she would therefore experience the atmosphere in such a clinical setting as being positive (Sercekus & Baskale, 2016:135; Charleston *et al.*, 2007:29).

4.6.3 Maintenance of facility and equipment

Item		Essential	Uncertain	Not needed	Responses
3	Facility / Equipment was well maintained	3	2	1	Round 1: (3) 64%; (2) 27%; (1) 9%
		Yes	No		
		3	1		Round 2: (3) 94%; (1) 6%

Comment: It is interesting to note that a 94% consensus rate was achieved after Round 2, while there was only 64% initial agreement on this item in Round 1. The item was sent to the second round due to the sum of “Essential” and “Uncertain” percentages being more than 70%. The researcher found this interesting, as her own subjective experience regarding poor maintenance of facilities and equipment in Africa is that this was always a problem which contributes to a negative atmosphere. The relevance of the item is well supported by several studies done in Africa (Naidoo *et al.*, 2017:236; Botma & Mackenzie, 2016:108; Lekalakala-Mokgele & Caka, 2015:2; Msiska *et al.*, 2014:35).

4.6.4 Availability of resources to perform tasks

Item		Essential	Uncertain	Not needed	Responses
4	Necessary resources were available to perform tasks well	3	2	1	Round 1: (3) 91%; (2) 4.5%; (1) 4.5%

Comment: During the first round, 91% of the panel was in agreement that the availability of sufficient and appropriate resources to perform tasks was an important item. The researcher argues that this is logical, as the availability of resources to perform tasks and achieve learning outcomes increases students' satisfaction levels about clinical placement. This was supported in the literature overview by Msiska *et al.*, (2014:35), who concurs that availability of resources directly influences students' clinical learning.

4.6.5 Organised unit

Item		Essential	Uncertain	Not needed	Responses
5	The unit was well organised	3	2	1	Round 1: (3) 90%; (2) 10%

Comment: During Round 1, 20 of the 22 panel members (90%) agreed that the clinical setting should be well organised to ensure a conducive atmosphere for students' WIL. Literature supports the item statement that a well-organised clinical placement sets the tone for students' clinical experiences, as well as the atmosphere of the clinical setting (Hooven, 2015:427).

4.6.6 Approachable supervisors

Item		Essential	Uncertain	Not needed	Responses
6	Supervisors were approachable	3	2	1	Round 1: (3) 100%

Comment: In Round 1, all the respondents agreed that supervisors in the CLE should be approachable for effective transfer of learning to take place in complex clinical environments. This is supported in literature as a point that contributes to, and assists students in their professional transition to becoming skilled healthcare professionals (Thomson *et al.*, 2017:520).

4.6.7 Reciprocal respectful relationships

Item		Essential	Uncertain	Not needed	Responses
7	There was a reciprocal respectful relationship between the supervisors and myself	3	2	1	Round 1: (3) 100%

Comment: All the panel members felt that it was important for reciprocal respectful relationships between supervisors and students in the clinical setting. A number of researchers described that appropriate and respectful behaviour of clinical staff towards students added to positive learning experiences (Dadgaran *et al.*, 2016:127).

4.6.8 Unity between healthcare professionals

Item		Essential	Uncertain	Not needed	Responses
8	There was unity between healthcare professionals in the unit.	3	2	1	Round 1: (3) 77%; (2) 18%; (1) 5%

Comment: This item achieved a consensus rate of 77% in Round 1. It is understood that the unity between the healthcare professionals in a clinical setting is an important component which contributes to the working atmosphere. This researcher strongly concurs with Schipbach's statement (2012:2) that without trust and respect

between healthcare professionals, meaningful interpersonal relationships, ward unity and learning would be compromised.

4.6.9 Trust between healthcare professionals

Item		Essential	Uncertain	Not needed	Responses
9	There was a sense of trust among healthcare professionals	3	2	1	Round 1: (3) 82%; (2) 13%; (1) 5%

Comment: A consensus rate of 82% was reached in Round 1 for the inclusion of this item in the new measurement tool. Three respondents were unsure whether the item should be included, while only one thought that this item should not be included in the instrument. As stated in the previous discussions, trust between healthcare professionals creates a sense of security for healthcare students placed in a clinical learning environment, as it contributes to the transfer of learning (Dimitriadou *et al.*, 2015:240; Palese *et al.*, 2014:218; Chuan & Barnett, 2012:196).

4.6.10 Positive attitude of healthcare professionals

Item		Essential	Uncertain	Not needed	Responses
10	Health science professionals had a positive attitude towards me.	3	2	1	Round 1: (3) 91%; (2) 9%

Comment: In Round 1, 20 respondents (91%) felt that a positive attitude of healthcare professionals towards students is essential in furthering a clinical learning atmosphere. Only two of the respondents were uncertain about this item, this inclusion consensus was reached. Abed *et al.* (2015:466); Beukes and Nolte

(2013:306) and Mabuda *et al.*, (2008:19) mention that positive attitudes of healthcare professionals help build and support a clinical setting's atmosphere.

4.6.11 Positive relationships with healthcare professionals

Item		Essential	Uncertain	Not needed	Responses
11	I was able to build positive relationships with all healthcare professionals.	3	2	1	Round 1: (3) 91%; (2) 4.5%; (1) 4.5%

Comment: In Round 1, consensus of 91% was reached about the importance of this item in the new instrument, although one respondent had commended that this item should rather focus on professional relationships. Chuan and Barnett (2012:193) noted that building positive relationships with healthcare professionals undoubtedly improved students' attitudes towards their clinical learning. This researcher and her supervisor reasoned that positive relationships with other healthcare professionals would be comprised of more formal interactions.

4.6.12 Participation in discussions

Item		Essential	Uncertain	Not needed	Responses
12	I freely participated in discussions on patient management.	3	2	1	Round 1: (3) 91%; (2) 9%

Comment: In Round 1, consensus was reached about the inclusion of this item. Health science professions all focus on and strive for good patient management and care. Students' sense of satisfaction with the clinical environment increased when they had the opportunity to participate in discussions on patient management (Nepal *et al.* 2016:181). Delivery of quality people-centred care also contributes to a

positive clinical setting, as this is the ultimate aim of health professional students' training.

4.6.13 Health science professional consideration for innovative ideas

Item		Essential	Uncertain	Not needed	Responses
13	Health science professionals considered innovative ideas regarding patient care.	3	2	1	Round 1: (3) 59%; (2) 27%; (1) 14%
		Yes	No		
		3	1		Round 2: (3) 88%; (1)12%

Comment: Consensus for this item was only reached after conclusion of Round 2. In Round 1 the total percentage between the choice of “Essential” and “Uncertain” scored more than 70%. Therefore this item was included in Round 2, where it reached inclusion consensus. Three respondents had commented that this item did not belong in this section. This comment will be referred for attention when further assessment and testing of the instrument is done in a next study. In assessment of construct validity, factor analysis would measure where this item best fits into the new instrument.

4.6.14 Professionalism of health science professionals

Item		Essential	Uncertain	Not needed	Responses
14	Health science professionals were professional in their actions	3	2	1	Round 1: (3) 95.5%; (2) 4.5%

Comment: In Round 1, 21 of the 22 panel members had felt that this item was essential to the new instrument. Health science professionals who are proficient in their conduct set an example of certified competence for students. Inclusion of this item is supported by the literature overview, which holds that the actions of skilled clinical staff increased professional growth in their students (Dimitriadou *et al.*, 2015:236; Hooven, 2014:316).

4.6.15 Person-centred care approach

Item		Essential	Uncertain	Not needed	Responses
15	Health science professionals demonstrated a person-centred care approach.	3	2	1	Round 1: (3) 68%; (2) 23%; (1) 9%
		Yes	No		
		3	1		Round 2: (3) 94%; (1) 6%

Comment: It was interesting to note that the 94% consensus rate of this item was only achieved after Round 2. This was rather a surprise to the researcher, as person-centred care is at the core of all healthcare professions. Even though WHO guides healthcare professions towards a uniform healthcare vocabulary, the terminology “Person” and “People-Centred Care” was clarified for the panel members, as the researcher felt that the fundamental meaning of this item might not be comprehended to be as important as it should be (WHO, 2015:10).

4.6.16 Clinical setting is all about the job

Item		Essential	Uncertain	Not needed	Responses
16	This unit is all about getting the job done.	3	2	1	Round 1: (3) 32%; (2) 36%; (1) 32%

Comment: No consensus was reached on this item in Round 1. The sum of “Essential” or “Not needed”, added to the neutral choice was less than 70%, therefore the item was removed from the instrument. The 32% achieved for “Essential”, 34% for “Uncertain”, and 32% for “Not needed” indicated stability of consensus in Round 2. Although the item is supported by Shivers *et al.*, as seen in Chapter 2 (2017:58), it was excluded based on lack of consensus.

4.6.17 Bullying in the clinical setting

Item		Essential	Uncertain	Not needed	Responses
17	I experienced bullying in this unit.	3	2	1	Round 1: (3) 59%; (2) 14%; (1) 27%
		Yes	No		
		3	1		Round 2: (3) 69%; (1) 31%
		3	1		Round 3: (3) 90%; (1) 10%

Comment: A 90% consensus rate for this item was only achieved after Round 3. Initially, 59% agreement on this item was captured in Round 1. The sum of “Essential” and “Uncertain” was above 70% in Round 1, so the item was repeated in Round 2. After Round 2 the consensus was 69%, but as the set criteria for content validity was 70%, the item was routed to Round 3. This result is of great interest to the researcher. Personal subjective experience and the buzz that bullying in the workplace is currently causing in healthcare had led the researcher to believe that this is a reality in all health science professions. Such behaviour is widely accepted as playing a contributing part in workplace atmosphere. The literature overview supported inclusion of this item in the new instrument, as authors such as Engelbrecht *et al.* (2017:8493); Meyer *et al.* (2016:62); Smith *et al.* (2016:506) and Weller *et al.* (2014:150) all concur that bullying remains a significant problem in clinical healthcare settings.

4.6.18 Satisfaction with a clinical rotation

Item		Essential	Uncertain	Not needed	Responses
18	I have a sense of work satisfaction after this clinical rotation	3	2	1	Round 1: (3) 82%; (2) 14%; (1) 4%

Comment: Eighteen of the 22 Round 1 respondents viewed students' sense of work satisfaction after a clinical rotation as essential for inclusion in the new instrument. Mabuda *et al.* (2008:20) highlighted that a positive atmosphere increases students' satisfaction levels with their clinical learning.

An analysis of the items and the responses of the experts in this section leads to one item being removed from the new draft instrument due to not reaching a 70% consensus rate. Four items went through to the second round, with one of them being sent for a third evaluation round. In the experts' opinion, all 17 items were found to reflect CLE face and content validity, thus remaining in the draft instrument.

4.7 RESPONSES TO TEAMWORK IN THE CLINICAL SETTING

This section of the study contained nine items, concentrating on exploring the experts' opinions regarding the substance of teamwork in a clinical setting. The focus falls on the value health science professionals place on one other; good communication; shared decision-making, as well as effective working relationships in the professional team. It also impacts on students' sense of belonging to and value in the health professional team; collaboration; shared expertise, and the role of team peer support. The panel responses submitted for each of the items regarding teamwork in a clinical setting will be presented and discussed next.

4.7.1 Content analyses of items 19-27

The items as listed below all reached a consensus of more than 70% in the first round.

Item		Essential	Uncertain	Not needed	Responses
19	Various health science professionals value each other.	3	2	1	Round 1: (3) 91%; (2) 9%
20	There was good communication among healthcare professionals.	3	2	1	Round 1: (3) 100%
21	There was shared decision-making among health science professionals.	3	2	1	Round 1: (3) 82%; (2) 14%; (1) 4%
22	I had a good working relationship with all healthcare professionals.	3	2	1	Round 1: (3) 82%; (2) 14%; (1) 4%
23	I felt like part of the health science professional team.	3	2	1	Round 1: (3) 91%; (2) 4.5%; (1) 4.5%
24	I was valued as a health science professional team member.	3	2	1	Round 1: (3) 91%; (2) 9%
25	Health science professionals collaborated to support my learning.	3	2	1	Round 1: (3) 91%; (2) 9%
26	Clinical facilitators shared their educational expertise with the team.	3	2	1	Round 1: (3) 95.5%; (2) 4.5%
27	My peers supported me during this clinical rotation.	3	2	1	Round 1: (3) 86%; (2) 14%

Comment: Responses to items 19 to 27 above will be discussed simultaneously as they all focus on teamwork in the clinical setting.

Item 19: In this item, 18 of the 22 respondents agreed to inclusion in the new instrument. One of the respondents commented that for effective teamwork, different health science professionals should value each other, which is linked further to inter-professional education. This comment is well supported by the

literature. Phillips *et al.* (2017:206) Anderson *et al.* (2014:518); Morphet *et al.* (2014:198) and Palese *et al.* (2014:2018) all highlight that students who participate in inter-professional learning came to respect each others' roles and acknowledged accountability for their own assignments. This developed unity among healthcare professionals, which in turn creates safe environments where students can learn.

Item 20: All the respondents agreed that good communication among healthcare professionals contributed to a positive CLE. The 100% consensus was achieved during Round 1. Corresponding to a statement by Baraz *et al.* (2015:6) in the literature overview, this researcher also found that good communication was a vital key to creating the ideal CLE.

Item 21: Consensus on this item was reached in Round 1 when 18 of the 22 panel members stated that shared decision-making among health science professionals was an essential factor in teamwork which also contributed to the CLE. Three panel members were uncertain about this point, and one felt that this item was not needed in the new instrument. Morphet *et al.* (2014:204) indicated that students who feel that they are part of the healthcare team are much more likely to communicate; will participate in decision-making on patient care and be more inclined to ask questions should they identify a gap in their knowledge.

Item 22: An 82% consensus in Round 1 was achieved by 18 of the 22 panel members' vote on this item. Respondent 26 was of the opinion that this item could also link to the quality of the work atmosphere. Item 22 states 'I had a good working relationship with all the healthcare professionals'. The researcher reviewed where this item had originated from, and found that it came from multiple existing instruments, where its construct validity and reliability had been established under the domain of teamwork. The researcher therefore decided to leave this item under the theme of teamwork in the clinical setting. It will be reviewed again during further testing of the final instrument.

Item 23: Consensus was reached in Round 1. The panel members acknowledged the importance of students feeling that they were part of a team. The sense of belonging where they were allocated is an important factor contributing to student's clinical learning experience, as confirmed by the literature review (Muthathi *et al.*, 2017:7; Phuma-Ngaiyaye *et al.*, 2017:164; Hooven, 2015:424; Mabuda *et al.*, 2008:25).

Item 24: Re the importance of this item, 20 of the 22 panel members indicated inclusion accord. The item stated 'I was valued as a health science professional team member'. As stated in Chapter 2, the literature overview firmly established that to ensure effective teamwork, team members needed to understand their clinical roles and responsibilities, as well as the roles and responsibilities of the other healthcare professionals involved in similar people-centred care (Babiker, *et al.*, 2014:11; Morphet, *et al.*, 2014:197; WHO, 2012:5).

Item 25: Round 1 assured consensus for the inclusion of this item. Hooven (2015:422) is held by literature to view that collaboration is needed among health science professionals to support students' clinical learning.

Item 26: Almost all the panel members (95%) agreed on inclusion of this item in the instrument, except for one member who remained uncertain during Round 1. The near-unanimous agreement between experts endorsed the strong literary evidence that clinical facilitators should share their educational expertise with the rest of the healthcare team. The WHO (2012:5), Babiker *et al.* (2014:11) and Morphet *et al.*, (2014:197) concurred that to share expertise and act as a collective unit are among the core characteristics of healthcare teams that deliver high quality care to patients.

Item 27: Nineteen of the 22 panel members viewed inclusion of this item as essential in Round 1. It is a well-known fact that peer support during a student's clinical rotation contributes to teamwork in the clinical setting. In the literature overview, as stated by Brynildsen *et al.* (2014:723), and Chuan and Barnett (2012:193), summarised in Chapter 2, it became clear that this element was often disregarded as a contributing factor for a supportive CLE. With an 86% inclusion consensus in Round 1, and only three-panel members uncertain about this item, the

researcher was reasonably sure that most of the experts also viewed peer support as essential to students' clinical learning.

In summary, all nine of the items in the section "Teamwork in the clinical setting" were included in the new draft instrument after Round 1.

The next discussions will refer to the workload in the clinical setting.

4.8 REPONSES TO THE WORKLOAD IN THE CLINICAL SETTING

This section focused on the workload of the student and the other role-players of the CLE. This part of the study consists of five items from the new instrument, and the responses that were submitted to the researcher about them.

4.8.1 Student or worker

Item		Essential	Uncertain	Not needed	Responses
28	I was treated like a student and not as a worker.	3	2	1	Round 1: (3) 73%; (2) 18%; (1) 9%

Comment: Consensus was achieved in Round 1 that this item about students being treated as such, and not as workers, was relevant and should be included in the draft instrument. However, the researcher did note that this consensus percentage was quite low in comparison to those in the prior sections. Despite the low inclusion agreement rate among local panel experts, literature clearly stated that it is often expected of students to play two roles in the clinical setting (basic worker and student), and that this could negatively influence students' ability to transfer learning during their clinical placement (Shivers *et al.*, 2017:59).

4.8.2 Difficulty to find help when needed

Item		Essential	Uncertain	Not needed	Responses
29	It was difficult to find help when needed.	3	2	1	Round 1: (3) 72%; (2) 14%; (1) 14%

Comment: Consensus was achieved in Round 1, with 16 respondents indicating that they agreed that it was sometimes difficult for students to find help when needed. From the literature it was clear that the main priority in most clinical settings is people-centred care (Hooven 2015:422). Accompaniment of students in training in the same clinical setting was often viewed as a secondary function, and less of a priority than the provision of care (Hooven, 2014:316).

4.8.3 Overwhelming amount of work

Item		Essential	Uncertain	Not needed	Responses
30	I was overwhelmed with the amount of work to be done in the unit.	3	2	1	Round 1: (3) 73%; (2) 18%; (1) 9%

Comment: Responses received from the expert panel included additional comments, such as "I think we must introduce them gradually to the workload to prevent them from feeling overwhelmed", and "Although this is not ideal, the workload in a lot of clinical settings is heavy and overwhelming. Students can add to this workload. The workload given to the student should, however, be managed". These comments gave the researcher the idea that the respondents were not quite clear on whose workload this item was referring to. The focus of this new instrument rests on students' evaluation of their CLE, to see whether it is conducive to their clinical learning. Thus the students' workload was meant to be evaluated. After

additional literature review, the researcher decided that the item statement should remain as is. Despite the seeming confusion, an inclusion agreement rate of 73% was reached in Round 1 on the item.

4.8.4 Workload is too heavy

Item		Essential	Uncertain	Not needed	Responses
31	The workload in this unit is too heavy.	3	2	1	Round 1: (3) 41%; (2) 32%; (1) 27%
		Yes	No		
		3	1		Round 2: (3) 56%; (1) 44%
		3	1		Round 3: (3) 50%; (1) 50%

Comment: After three rounds, no consensus on the above item had been achieved. After Round 1, the inclusion percentage was 41%. Only when the “Essential” and “Uncertain” percentages were calculated did it rate more than 70%. The item was therefore routed to Round 2. In Round 2 the inclusion percentage reached 56%, but after the third round it dropped to 50%. The stability of responses was noted, and the item was omitted from the draft instrument, despite its literature proven relevance to the CLE.

4.8.5 The ability to negotiate workload

Item		Essential	Uncertain	Not needed	Responses
32	I was able to negotiate my workload.	3	2	1	Round 1: (3) 68%; (2) 23%; (1) 9%
		Yes	No		
		3	1		Round 2: (3) 63%; (1) 37%
		3	1		Round 3: (3) 80%; (1) 20%

Comment: Consensus of 80% on the above item was only achieved after Round 3. The Delphi panel members were of the opinion that there were set guidelines and policy on the number of clinical hours tertiary students had to work, and that each HSEI would determine which of their students' learning outcomes / objectives had to be reached during a specific clinical placement. This was described by one respondent "Each university as their clinical practice outcomes/objectives for each block with the specified workload, so not sure if the workload can or should be negotiated" and another respondent's feedback was "The workload given to the student should be managed". The conclusion was that some panel members were unsure whether a students' workload could or should be negotiated. It was interesting to note that these specific responses came from the dietitian, occupational therapist, physiotherapist, and radiographer.

The item originated in an instrument for measuring nursing students' workload. It could be that the other health science professionals are not seen as usually being part of the workforce, as happens regularly in nursing. The concept of workload negotiation would therefore not be known or relevant to them.

On analysis, it became clear to the researcher that the items in this section of the study had generated the most concern among the experts. Of five items, one was dropped from the draft instrument due to failure to reach consensus. The other undecided items' consensus scores were quite low in comparison to the previous sections. This lead the researcher to believe that the workloads of the various health professional students differ with regard to professions and clinical settings.

4.9 LEARNING OPPORTUNITIES FOUND IN THE CLINICAL SETTING

This study section contained 34 items, focusing on the learning opportunities offered by clinical settings. Thus this, the largest portion of the newly developed instrument relates to the determining and assessment of learning opportunities. The responses of the panel members on this subject are discussed next.

4.9.1 Excitement about the clinical rotation

Item		Essential	Uncertain	Not needed	Responses
33	I was excited about this clinical rotation	3	2	1	Round 1: (3) 59%; (2) 18%; (1) 23%
		Yes	No		
		3	1		Round 2: (3) 69%; (1) 31%
		3	1		Round 3: (3) 90%; (1) 10%

Comment: On this item, 90% consensus was only achieved after Round 3. Initially in Round 1, only 59% agreement was reached. After the calculation was done by adding the “Essential” and “Uncertain” percentages, consensus extended beyond the 70% mark. The item was therefore submitted to the second round. Literature supports that a student’s attitude towards clinical learning would influence the transfer of clinical learning positively or negatively (Chuan & Barnett, 2012:192), and that this is a factor to be reckoned with.

4.9.2 Awareness of the unit’s expectations

Item		Essential	Uncertain	Not needed	Responses
34	I knew what was expected of me in this unit.	3	2	1	Round 1: (3) 82%; (2) 14%; (1) 4%

Comment: Literature supports that the expected learning outcomes of the clinical setting should correspond with the academic learning outcomes for students to facilitate transition of clinical learning (Muthathi *et al.*, 2017:1; Mabuda *et al.*, 2008:25). Eighteen of the 22 panel members agreed on this item, and therefore it was included in the new draft instrument.

4.9.3 Multiple learning opportunities

Item		Essential	Uncertain	Not needed	Responses
35	This unit offered multiple learning opportunities	3	2	1	Round 1: (3) 95.5%; (1) 4.5%

Comment: The panel was in agreement during Round 1 that all clinical settings should provide multiple learning opportunities, which then would contribute to a positive CLE. The researcher supports this concept: Added learning opportunities during their placement does keep students interested in various clinical learning prospects (Saarikoski *et al.*, 2009:595).

4.9.4 Clear clinical learning outcomes

Item		Essential	Uncertain	Not needed	Responses
36	It was clear which of my clinical learning outcomes could be achieved in this unit.	3	2	1	Round 1: (3) 86%; (2) 9%; (1) 5%

Comment: In the researcher's opinion, the consensus views achieved in Round 1 and tabled above, are authentic. If students were not clear on their expected clinical outcomes, they would feel frustrated and experience the CLE as a negative encounter (Phillips *et al.*, 2017:205). This creates an expectation that engaged clinical staff should guide and support students in an effort to clarify their clinical learning outcomes as much as possible.

4.9.5 Achieving learning outcomes

Item		Essential	Uncertain	Not needed	Responses
37	I could achieve most of my clinical learning outcomes	3	2	1	Round 1: (3) 82%; (2) 14%; (1) 5%

Comment: The panel was in agreement that achievement of all or most of their clinical learning outcomes are an important factor contributing to students' experience of the CLE. The researcher argues that this is indeed logical, as the achievement of learning outcomes increases motivation and would aid in the transfer of learning and competence (Mansutti *et al.*, 2017:61).

4.9.6 Optimising learning opportunities

Item		Essential	Uncertain	Not needed	Responses
38	I was encouraged to optimise my learning opportunities.	3	2	1	Round 1: (3) 95.5%; (1) 4. 5%

Comment: Twenty-one of the 22 panel members agreed in Round 1 that clinical staff should encourage students to optimise their learning opportunities in the CLE. This item was strongly supported by literature, which states that students are meant to be guided and directed by clinical staff and facilitators to identify learning opportunities and receive information on approaching learning opportunities. Encouraging them to optimise their own learning opportunities also builds a positive attitude towards the CLE (Hooven, 2015:421).

4.9.7 Clinical meetings as a valuable learning opportunity

Item		Essential	Uncertain	Not needed	Responses
39	Clinical meetings were valuable learning opportunities.	3	2	1	Round 1: (3) 86%; (2) 5%; (1) 9%

Comment: Out of the 22 panel members in Round 1, 19 agreed that clinical meetings would be a valuable learning opportunity. According to Chuan and Barnett (2012:192), and Saarkoski *et al.*, (2009:595), a variety of training opportunities should be created, including clinical meetings where interested students could ask questions regarding patient care, or if they do not understand what is expected of them. From personal experience the researcher concurs that healthcare students find much benefit in these types of occasions.

4.9.8 Directing students towards learning opportunities

Item		Essential	Uncertain	Not needed	Responses
40	Health science professionals directed me towards learning opportunities.	3	2	1	Round 1: (3) 86%; (2) 9%; (1) 5%

Comment: Nineteen of the 22 respondents felt that healthcare professionals should direct students towards suitable learning opportunities. Hooven (2015:421) specified how important it is to guide students' learning as a form of support to them, as more fully described in the literature overview of Chapter 2.

4.9.9 Guidance in acquiring new skills

Item		Essential	Uncertain	Not needed	Responses
41	The health science professionals guided me in acquiring new skills.	3	2	1	Round 1: (3) 91%; (2) 9%

Comment: Consensus was achieved in Round 1 that health science professionals' guidance is needed for students to acquire new skills. Chuan and Barnett (2012:193) highlight that effective guidance in finding suitable learning opportunities contributes to the CLE. This would therefore also contribute to the substance and potential of the new draft instrument.

4.9.10 Student independence is allowed

Item		Essential	Uncertain	Not needed	Responses
42	I was allowed more independence as my skills increased.	3	2	1	Round 1 (3) 100%

Comment: Uncontested consensus was reached in Round 1 that students should be allowed more independence and self-sufficiency as their skills increased in the clinical setting. This item was also well supported by D'Souza *et al.* (2015:833), and Chuan and Barnett (2012:192) in the literature overview. They state clearly that independence leads students to gain self-confidence while perfecting their clinical skills. In Round 1 all the respondents agreed that this item should be included in the new instrument, as it contributes to the inclusiveness of a CLE's content measurement.

4.9.11 Work at own pace

Item		Essential	Uncertain	Not needed	Responses
43	I was allowed to work at my own pace.	3	2	1	Round 1 (3) 36%
		Yes	No		
		3	1		Round 2 (3) 63%
		3	1		Round 3 (3) 60% (1) 40%

Comment: The above item was one of the items on which consensus was not reached, even after three rounds. This may be due to the diversity of health science programmes and curricula that do not allow students to work at their own pace. The greatest degree of consensus was in Round 2, where 63% of the respondents were of opinion that students should be allowed to work at their own pace. Although the literature overwhelming stated that health professional students should be allowed to pick their own work pace, many on the expert panel disagreed and therefore this item was dropped from the new instrument.

4.9.12 Competing with other students

Item		Essential	Uncertain	Not needed	Responses
44	We were competing with each other to practice clinical skills.	3	2	1	Round 1 (3) 50%; (2) 14%; (1) 36%

Comment: This item was also removed from the draft instrument due to no consensus being reached after Round 1. The set criteria for admittance to the second round included the following: Should the sum of "Essential" or "Not needed", calculated with the neutral choice included, reach 70% or more, an item would be reallocated to the second round. If the sum reached less than 70%, an item would be removed from the draft instrument. In this instance, the sum was less than 70%.

4.9.13 Confidence

Item		Essential	Uncertain	Not needed	Responses
45	I became more confident during this rotation	3	2	1	Round 1: (3) 82%; (2) 9%; (1) 9%

Comment: Consensus was reached in Round 1 after 18 of the 22 respondents agreed that students should be provided with opportunities to become more confident during WIL. Sercekus and Baskale (2016:135) confirmed that students gain confidence during the delivery of effective people-centred care, and that patients simultaneously received high quality care when a skilled healthcare practitioner supervised a student's exact task performance.

4.9.14 Individual attention

Item		Essential	Uncertain	Not needed	Responses
46	I received individual attention	3	2	1	Round 1: (3) 73%; (2) 18%; (1) 9%

Comment: In Round 1, only 16 of the 22 respondents agreed that students should receive individual attention. The researcher argues that the lower agreement percentage reflected similar findings in the literature. Botma and Mackenzie (2016:105) determined that individual attention should be given to students to effectively support them on a cognitive level in the CLE, but that this is seldom provided due to the complexity of acute-care or demanding CLEs.

4.9.15 Supervisor awareness of student learning needs

Item		Essential	Uncertain	Not needed	Responses
47	My supervisors were aware of my learning outcome needs.	3	2	1	Round 1: (3) 91%; (1) 9%

Comment: The panel was already in agreement during the first round that supervisors' awareness of students' learning needs contributed to learning opportunities in the clinical setting. The researcher argues that this is indeed logical, as supervisors know their own clinical settings, and were expected to link their students' learning needs to appropriate learning opportunities. It has been proven that students felt more satisfied with their clinical placement if supervisors took note of their learning needs (Sercekus & Baskale, 2016:134; Smith, 2012:172).

4.9.16 Supervisors spend time with students

Item		Essential	Uncertain	Not needed	Responses
48	Supervisors spent sufficient time with me.	3	2	1	Round 1: (3) 82%; (2) 14%; (1) 5%

Comment: After Round 1, 18 of the 22 expert respondents agreed that this item should be included in the new draft instrument. Three of the respondents remained uncertain, while one felt that this item was not needed. Botma and Mackenzie (2016:105) proved that to provide effective cognitive support, supervisors needed to spend sufficient time with students in the CLE and pay them individual attention.

4.9.17 Supervisors link theory to practice

Item		Essential	Uncertain	Not needed	Responses
49	My supervisors assisted me to link theory to practice.	3	2	1	Round 1: (3) 95.5%; (1) 4.5%

Comment: The main goal of WIL is linking theory to practice. Almost all the respondents agreed in Round 1 that clinical supervisors should link theory to practice as much as possible, so that students could perceive the CLEs as positive and beneficial. However, one respondent advised that it was important to measure whether the conditions covered in the classroom would be similar to what the students would have to manage in the clinical setting, as they needed to be aligned. This expert also raised the question whether this item could not perhaps be replaced by Item 59 (regarding a possible mismatch between what was taught in class and experienced during the clinical rotation). After deliberation, the researcher decided to refer this item as well for further testing of the construct validity.

4.9.18 Supervisors facilitate clinical reasoning

Item		Essential	Uncertain	Not needed	Responses
50	Supervisors facilitated my reasoning regarding patient management.	3	2	1	Round 1: (3) 95.5%; (2) 4.5%

Comment: In Round 1 the inclusion consensus for this item as part of the new instrument was 95.5% when 21 of the 22 respondents were in agreement. Literature reinforced the conception that students should be cognitively supported during their WIL to ultimately ensure competent healthcare professionals (Botma & Mackenzie, 2016:106; Saarikoski *et al.*, 2009:595).

4.9.19 Supervisors application of innovative learning activities

Item		Essential	Uncertain	Not needed	Responses
51	Supervisors applied innovative learning activities.	3	2	1	Round 1: (3) 77%; (2) 18%; (1) 5%

Comment: As part of the cognitive support provided to students in the CLE, it would be a supervisor's responsibility to utilise innovative learning activities to ensure transfer of learning. These activities would also increase students' general feelings of satisfaction with clinical learning experiences. Inclusion consensus regarding this item was quickly reached during Round 1.

4.9.20 Supervisors provide emotional support

Item		Essential	Uncertain	Not needed	Responses
52	The supervisors considered my emotional responses to clinical experiences.	3	2	1	Round 1: (3) 77%; (2) 18%; (1) 5%

Comment: Regarding this item, inclusion consensus of 77% was reached in Round 1. A similar level of agreement on the subject was found in the literature overview. Hugo (2018:55) indicated that emotionally supporting students installed feelings of confidence and value in them, which contributed to a positive learning experience.

4.9.21 Satisfaction with the supervision received

Item		Essential	Uncertain	Not needed	Responses
53	I am satisfied with the supervision I received.	3	2	1	Round 1: (3) 73%; (2) 23%; (1) 4%

Comment: Consensus about this item was achieved in Round 1. During the literature overview it became clear that the quality and quantity of supervision that students received during CLE placement directly influenced their satisfaction levels (Sercekus & Baskale, 2016:134; Smith, 2012:172). However, two respondents felt that this item does not belong in the section on learning opportunities in the clinical setting. The researcher again felt that construct validity would be determined with further testing, and decided to keep this item under learning opportunities in the interim.

4.9.22 Supervisors demonstrate expert skills

Item		Essential	Uncertain	Not needed	Responses
54	Supervisors demonstrated expert patient management skills.	3	2	1	Round 1: (3) 91%; (2) 4.5%; (1) 4.5%

Comment: With regard to this item, 20 of the 22 respondents from Round 1 agreed that it is essential that supervisors demonstrated expert patient management skills. Across all the professions, the experts agreed that examples set in a clinical setting are highly significant for their students' clinical learning.

The researcher would go as far as saying that the expression "monkey see, monkey do" could be quite relevant during WIL.

4.9.23 Involvement during patient care

Item		Essential	Uncertain	Not needed	Responses
55	I was actively involved in managing patients.	3	2	1	Round 1 (3) 86%; (2) 14%

Comment: In Round 1, consensus of 86% was reached on the issue that students wanted to be actively involved in authentic patient management. Student engagement with patients was strongly supported by the literature overview. Mansutti *et al.* (2017:61) mentioned that students' active engagement is one of the factors that influence a student's capacity to achieve desired learning outcomes. In the same manner, this researcher also recognises and acknowledges the importance of this aspect of the CLE.

4.9.24 Managing patients under supervision

Item		Essential	Uncertain	Not needed	Responses
56	I managed patients under supervision.	3	2	1	Round 1: (3) 91%; (2) 4.5%; (1) 4.5%

Comment: As indicated by Item 55, opportunities should be created for students to become actively involved in patient care and manage patients under supervision. During Round 1, 19 of the 22 panel members indicated that this item is essential for inclusion in the draft instrument. Only one respondent felt that this was not needed, while another one remained uncertain about the subject. Literature made it clear that a high-quality CLE should allow students to effectively manage patients under supervision, thus honing their skills (Meyer *et al.*, 2009:84; Jansson & Ene, 2016:17).

4.9.25 Encouragement to ask questions regarding patient care

Item		Essential	Uncertain	Not needed	Responses
57	I was encouraged to ask questions regarding patient management.	3	2	1	Round 1: (3) 100%

Comment: All the panel members agreed that students should be encouraged to ask questions regarding patient management during their WIL. They felt that asking questions was an ideal opportunity for students to learn. An additional comment was added, indicating that the respondent felt that Items 56 and 57 could be integrated into one item. The researcher considered the suggestion, but decided that these two items measured two different aspects about learning opportunities in the CLE. Item 56 focuses on whether students are allowed to perform tasks under supervision (utilising every learning opportunity to perform tasks themselves) and Item 57 probes whether students were allowed to ask questions when uncertain (using unstructured learning opportunities for clinical staff to answer queries).

4.9.26 Theoretical preparedness

Item		Essential	Uncertain	Not needed	Responses
58	I was prepared theoretically for this rotation.	3	2	1	Round 1: (3) 82%; (2) 14%; (1) 4%

Comment: Health Science Education Institutions' main goal is the academic preparation of healthcare students for their clinical experiences. The science / theoretical component is an important part of all healthcare students' professional competence, as seen in Chapter 2's literature reviews. Students should be furnished

with scientific knowledge to prepare them to integrate theoretical learning into practice by themselves. In other words, students who were not theoretically prepared cannot become clinically competent in their professions, as they lack the scientific background required. This finding from literature was confirmed by the high consensus the related item achieved from the expert panel during Round 1. The item therefore remains relevant to any instrument that strives to measure the CLE.

4.9.27 Mismatch between what was taught and reality

Item		Essential	Uncertain	Not needed	Responses
59	There was a mismatch between what was taught in class and my experiences during the clinical rotation.	3	2	1	Round 1: (3) 64%; (2) 18%; (1) 18%
		Yes	No		
		3	1		Round 2: (3) 94%; (1) 6%

Comment: The consensus achieved in Round 2 established that the expert panel viewed that students commenting on any incidences of experiencing learning confusion during their clinical placement was relevant to the CLE or not. The item was clarified by the researcher in the feedback after Round 1, as it seemed that the panel were unsure of what they were being asked. In Round 2, 15 of the 16 respondents reached consensus that the question was significant, thus retaining it in the new instrument. The necessity of feedback from the students had been supported in the literature overview, as described in Chapter 2.

4.9.28 Evaluation of clinical performance

Item		Essential	Uncertain	Not needed	Responses
60	I was evaluated on my clinical performance.	3	2	1	Round 1: (3) 91%; (2) 9%

Comment: Evaluation of students' performance in the CLE has been one way of establishing the efficiency of students' theoretical preparation; the aptness of the learning outcomes and the achievement of professional competence. The panel members reached a consensus agreement that evaluation of student's clinical performance was required to determine professional competence, as well as the value CLEs brought to students' clinical learning. Subsequently, this item will remain in the new draft instrument.

4.9.29 Constructive feedback

Item		Essential	Uncertain	Not needed	Responses
61	I received constructive feedback on my performance.	3	2	1	Round 1: (3) 82%; (2) 4%; (1) 14%

Comment: Feedback to a student in the clinical setting is a good learning / teaching opportunity, and has always been an essential part of the evaluation of clinical performance and learning (Liu *et al.*, 2015:128). Consensus of 82% was that this item was essential for inclusion in the new instrument, as constructive feedback will remain relevant to the CLE.

4.9.30 Continuing feedback

Item		Essential	Uncertain	Not needed	Responses
62	I continuously received constructive feedback on my performance.	3	2	1	Round 1: (3) 86%; (2) 9%; (1) 5%

Comment: Nineteen of the 22 respondents in Round 1 agreed that continuing feedback to healthcare students in training is a learning opportunity that should be utilised at every opportunity. The researcher supports the inclusion of this item in the new instrument as well, as anecdotal personal experience proved that often the only constructive guidance many students received in a clinical setting was the compulsory feedback after WIL or a clinical assessment.

4.9.31 Reflection on clinical learning

Item		Essential	Uncertain	Not needed	Responses
63	I was encouraged to reflect on my clinical experiences.	3	2	1	Round 1: (3) 100%

Comment: All the panel members felt that it was important to encourage students to reflect on their clinical experiences. The aim is to have students analyse their own performance in the CLE and identify areas requiring improvement during future performances (Kilty *et al.*, 2017:1). Reflective learning strategies are an acknowledged method of reaching professional competence in the CLE.

4.9.32 Development of professional identity

Item		Essential	Uncertain	Not needed	Responses
64	My professional identity was developed.	3	2	1	Round 1:(3) 91%; (2) 9%

Comment: During the first round the panel was in agreement that the CLE facilitated healthcare students in developing a professional identity. Sethi and Khan (2018:359) also confirmed that a CLE of high standard would allow the development of students' professional identity by offering opportunities to learn. Thus, this item will be included in the new instrument.

4.9.33 Satisfaction with the learning experience

Item		Essential	Uncertain	Not needed	Responses
65	I am satisfied with my learning experience in this unit.	3	2	1	Round 1: (3) 91%; (2) 4.5%; (1) 4.5%

Comment: One of the acknowledged successes of WIL has been the learning benefits that accompanied students' satisfaction with the clinical learning experience, as endorsed by the literature review. In Round 1, 20 of 22 panel members overwhelmingly agreed to the inclusion of this item in the new draft instrument.

4.9.34 Role models

Item		Essential	Uncertain	Not needed	Responses
66	Health science professionals were good role models.	3	2	1	Round 1: (3) 82%, (2) 14%, (1) 5%

Comment: This item portrays the importance good role models played in the healthcare student's professional development (Anderson *et al.*, 2014:518; Meyer *et al.*, 2009:91). The consensus views of the panel members also indicated the relevance they ascribed to good role models in students' clinical learning environments. The researcher supports assessment of the students' views regarding good role models in an effort to find their own professional identity and competence.

The learning opportunities in the clinical setting represented more than half of the total number of items on the new instrument. In 32 of the 34 items, consensus agreements featured compellingly in the panel members' opinions. After three rounds in the Delphi study, two of the existing measurement items were removed from this section of the new instrument due to failure to reach consensus.

4.10 SUMMARY

This chapter presented and discussed the Delphi instrument's results and findings, which were applied by the researcher to verify the face and content values of the new, CLE measurement instrument. Analysis was performed on the items presented for inclusion in the instrument for students, and the responses from the expert healthcare professions' panel that assessed them. Four items was removed from the first version instrument due to failure to reach a 70% consensus rate from the panel members. Two items were excluded after Round 1, as stability had been reached. Nine further items were sent to Round 2, together with the researcher's detailed feedback on the results from Round 1. In Round 2, 16 panel members

participated in the re-assessment of re-routed items that lacked inclusion consensus.

Round 2 delivered inclusion consensus on four items from the new instrument. After receiving the researcher's feedback from Round 2, 10 respondents agreed on a further three items for inclusion. Two items remained beyond agreement and were therefore removed from the instrument.

The final list comprised of a total of 62 items that are, in the experts' opinion, items that reflect face and content validity. The researcher is confident that all aspects of the CLE may be measured when implementing this instrument taking Chapter 2 literature overview into account. The second version of the new CLE measuring instrument (V2) was constructed from these items, collected during the Delphi study (See Addendum E). In the future, another researcher will be testing this version of the instrument further for reliability and construct validity before it could be used to measure students' clinical learning environments.

The next chapter will provide an overview of the study, including an indication of the limitations in this study, and some recommendations for future research.

CHAPTER 5

Conclusions, limitations and recommendations

5.1 INTRODUCTION

In this chapter, the major findings and conclusions of the study on designing a measurement instrument for CLEs are discussed. The chapter also includes the study's identified strengths and limitations, along with the implications of the findings for the health sciences, and proposed recommendations for further research. Lastly, the value of the study is highlighted.

There is a continual need for competent healthcare professionals worldwide. To promote competence in health professional students, Donovan and Darcy (2011:123) identified student characteristics; training designs; the transfer climate and work environment as contributing factors in creating the motivation to learn, and develop competence in professionals. Botma *et al.* (2013:33) added having clinical facilitator support to the transfer of learning model.

After concluding the study, the researcher concurs that these factors are crucial, while highlighting the transfer climate and work environment as being representative of the CLE. The CLE has been identified as a major contributor and influential factor in the development of competent health professional students during WIL. On the other hand, some CLEs are not beneficial for students to learn in and may even hinder optimal development. Therefore, the need for a conducive CLE where students can successfully transfer their learning and become professionally competent is pivotal to training in the health sciences and should not be overlooked when planning and executing WIL.

To comprehensively measure healthcare CLEs, the researcher aimed at developing an instrument to measure existing CLEs used in current clinical settings against factors known to contribute to a positive learning environment. CLEs are defined as any environment where students have the opportunity to integrate theory and practice to create meaningful learning experiences and provide safe people-centred care, while being supported by relevant role-players and influenced by various factors in the clinical setting (D'Souza *et al.*, 2015:833; Jansson & Ene, 2016:17; Muthathi *et al.*, 2017:1). As part of healthcare professional training, students are placed in clinical settings for WIL. Various role-players support these students to achieve their learning outcomes. The conceptual framework of the CLE, as illustrated in Figure 5.1, was used as the foundation to describe the role-players' collaboration and interaction in this setting.

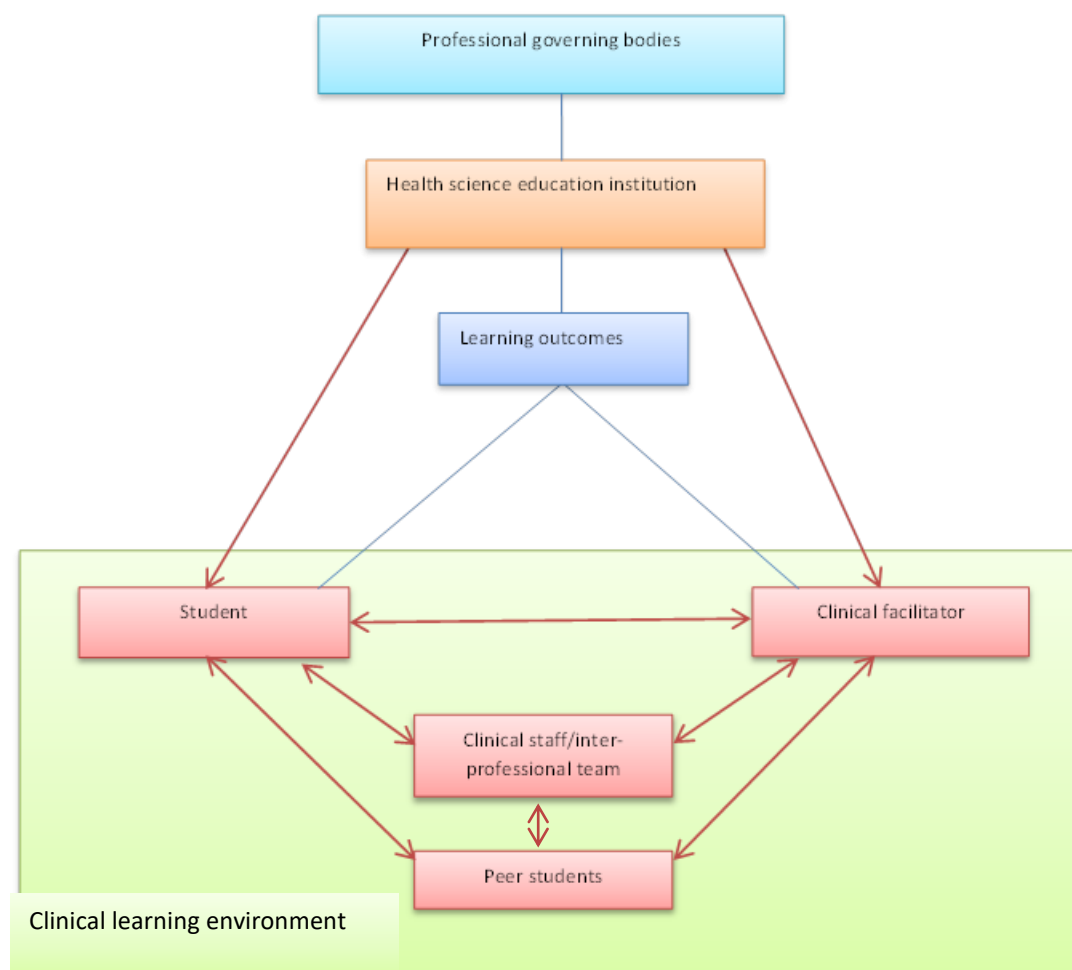


FIGURE 5.1: Conceptual framework of the CLE (adopted from Botma, *et al.*, 2013)

The role-players referred to include 1) *Students*, who are the key focus of all the activities in the clinical education setting; 2) *Clinical staff*, which also includes inter-professional teams and the *clinical facilitators* responsible for students' learning; 3) *Peer students*, who support fellow undergraduates in the clinical setting; 4) *Clinical settings*, in which the bedside learning takes place; 5) *HSEIs*, who are responsible for the formal education programmes, and lastly 6) *Professional governing bodies*, who set the standards for practice and education per profession.

The setting where students are placed for their WIL is known as the CLE. The quality of a CLE has a direct influence on students' satisfaction with their clinical placement, and the success of their present and future learning achievements (Lovecchio *et al.*, 2015:254; Chuan & Barnett, 2012:192; Mannix *et al.*, 2009:63). The main goal of a CLE is to create competent health professional students for the future workforce.

Through a comprehensive literature overview, the researcher established that the CLE should have certain characteristics in order for students to best transfer their learning. These aspects contribute meaningful learning opportunities and support health professional students in enriching their skills. To conceptualise these CLE characteristics during the literature overview, the researcher highlighted four major aspects that identify high-quality CLEs, which include the atmosphere or ambiance set for student learning; the teamwork and collaboration between role-players; the workload of clinical staff and students, and the learning opportunities offered by the clinical setting. These four pillar factors assisted the researcher in categorising the items necessary in a measurement instrument.

The researcher reviewed existing CLE measuring instruments and evaluated them against the identified factors, to see if they could still be used to measure a CLE. None of the existing instruments measured all the aspects identified as being critical to current WIL. Subsequently a new instrument was developed, aimed at filling the gaps identified in present CLEs and improving health professional students' clinical competence levels.

5.2 OVERVIEW OF THE STUDY

This study aimed at developing an instrument to measure all relevant aspects of CLEs where health science students are placed for WIL. To measure the CLE, the researcher had to achieve the objectives as set out in Chapter 1 of the study. These objectives included to 1) Develop an instrument based on existing instruments that measure the clinical learning environment, and 2) Determine the face and content validity of the proposed instrument. This research study was executed in two phases. The first phase started with a general literature overview of healthcare CLEs for securing existing and available instruments. Nineteen existing instruments were identified, with a qualitative dataset of 454 assessment items being obtained from them. Through an inductive process, items were thematised into 66 new items, and the first version of the proposed instrument was compiled.

The second phase determined the face and content validity of the first version instrument developed in Phase 1. An expert panel of health science professionals included qualified dietitians; dentists; nurses; occupational therapists; physiotherapists; medical physicians; pharmacists and radiographers confirmed the face and content validity of the items with a consensus Delphi study. A consensus rate of 70% was used to validate the content of the items and ensure that all aspects of the CLE were covered. From the 66 items, the expert panel agreed on the inclusion of 62 items, confirming their face and content validity. The Delphi study was concluded over three rounds. After the Delphi study, a second version of the proposed measurement instrument was compiled.

5.3 CONCLUSIONS FROM THE DELPHI STUDY

There are several conclusions to be drawn from the Delphi study. The diversity in the health science professions had made it challenging to develop an instrument that would fit all health science professions.

Not all the health science professions' clinical placements are the same. In some clinical settings, healthcare students are considered to be part of the workforce.

They are expected to work with patients to relieve the daily workload in clinical settings, e.g. nursing students.

Another case in point is that many of the HSEI regulate the workload of students in the clinical settings, and that the workload is dependent on the students' expected learning outcomes. As described by one respondent: "Each University has their clinical practice outcomes / objectives for each block, with the specified workload, so not sure if the workload can or should be negotiated". Another respondent's feedback was "The workload given to the student should be managed". Although it is difficult to design a "fit for all" instrument for all health science professions, a possible solution could be to introduce a "Not Applicable" rating option for those health science professions where a particular item is not relevant.

Some of the respondents were of opinion that certain items did not fit into the category indicated, such as Item 52, which stated: "The supervisors considered my emotional responses to the clinical experiences". A respondent felt that this item did not belong in the section on learning opportunities in the clinical setting. The researcher recognised their opinions, as well as the fact that the items in question could be moved to other categories, and stated this in her report. However, explorative factor analysis will be done during further testing of the items and the instrument by a future researcher. But for the purpose of the Delphi study, only face and content validity were determined. The researcher finally is of opinion that the content of these items are trustworthy and relevant to measure the CLE in each category.

Even after removal of four items, the new instrument remains lengthy. This can lead to participants becoming fatigued during its completion, which in turn may influence the instrument's global reliability. Only after an explorative factor analysis is completed, would it be determined whether some of the items are reliable or not.

Every research project develops some form of limitation. The researcher identified limitations in this study and will discuss them in the following section.

5.4 LIMITATIONS OF THE STUDY

The researcher considers the following to be study limitations that need to be highlighted:

The time line of the PICOT was based on a decision on the health system in South Africa. This decision may not be sufficient when searching for literature globally.

Although the number of responses was adequate for face and content validity, a bigger sample size would improve the authority and trustworthiness of the study. The study was done during the first peak of the COVID-19 pandemic in Africa, placing the Delphi study's panel of health science professionals in the frontline of the emergency, which influenced the respondents' availability to respond and provide feedback.

Health science professions like paramedics, biokineticists and optometrists had indicated their interest in participating in the study, but ended up not taking part at all. Therefore, it is difficult to generalise the opinions of the available experts to all the various health science professions. However, the researcher would ensure that these professions are included in the reliability and construct validity testing, planned for Phase 3.

The possibility to generalise findings between various health science professions could be compromised due to some of the professions only placing their students in the CLE for short block sessions, whereas others rotate their students into clinical settings for longer periods of time.

The researcher found it difficult to find universal healthcare terminology to use among the various health sciences professions. One of the expert responses was that health science professions used "different language" for certain things, which could influence the interpretation of the items and data outcome.

Another limitation was that data was collected via email. There was no clarification of items beforehand. Respondents could possibly have interpreted the items in a different manner than the researcher had originally intended.

In this study, only face and content validity were established, which are both considered to be weak forms of validity.

Some clinical healthcare professions, such as speech-therapists; audiologists; social workers, and psychologists were not included in the study.

The instrument was developed for this specific target group, the health professional students placed in the CLE, to determine if the CLE are conducive for WIL.

Despite the limitations of the study, the strengths of the study surpass the limitations that have been highlighted.

5.5 STRENGTH OF THE STUDY

The strengths of the study contribute to the value of the study.

Two strengths of a Delphi study lie in the selection of the expert panel members and the volume of representation that influences the quality of the results. The response rate was more than ten respondents in all three rounds of the Delphi study, indicating a good response rate that was statistically sufficient for determining content validity (Falzarano & Pinto Zipp, 2013:100; Giannarou & Zervas, 2014:67; Waggoner *et al.*, 2016:664).

A further strength rests on the fact that the data was collected from five different Sub-Saharan African countries. The quality of the data is therefore considered to be valuable. This instrument can therefore be considered for use in other resource-poor African countries.

Despite the absence of some health science professions during the determination of its face and content validity, the instrument does represent respondents from a wide range of health science professions, and can therefore be used by a variety of healthcare professions.

The selection of panel members focused on the experts' experience within the field of study. The experts that participated had an average of 15.6 years experience in the CLE, and only two of the 22 panel members spent less than 2-6 hours per week with students in the clinical setting. The selection and participation of these expert panel members contributes to the vigour and credibility of the study.

The establishment of face and content validity of the 62 items in the second version CLE instrument proves the quality of the study, even before further psychometric testing is done. The new instrument's face and content validity makes it applicable for a variety of health science settings. Although a number of studies had been done for nursing and medicine specialities, up to now not many instruments were available to measure CLEs in the other health science professions.

The draft instrument could be useful in a number of ways in health science education. For example, it could be used as a measurement instrument for new CLEs. All new clinical settings could be measured once students were placed in the setting for their potential contribution to WIL, so that benefit assessments could be done regarding the value of placing students-in-training in those areas. Data collected by using such an instrument could indicate inherent weak areas that would need additional student preparation or strengthening, or aspects that would sustain or reward study. Governing bodies could find benefit in using it to accredit clinical settings for examination purposes, as they would be reasonably sure that students would have been able to achieve their learning outcomes there.

The instrument may prove to be valuable for use in the majority of health science professions in Sub-Saharan Africa, setting the tone for further research in this field of study.

5.6 RECOMMENDATION FOR FUTURE RESEARCH

There are some recommendations that could be made for future research originating from this study. The next step following this study would be to apply Phase 3, where testing of the second version of the instrument takes place to determine its reliability and construct validity. Being tested for reliability would also gauge the quality of the instrument.

Reliability refers to the consistency with which the instrument measures the target attribute; in other words, to establish whether responses remain consistent when repeated. Internal consistency could be determined by using Cronbach's alpha. Thereafter the reliability of the instrument could be strengthened by performing a stability test-retest. Without proven reliability, an instrument is not valid for measuring a target attribute.

Evaluating construct validity is also recommended for assessing the quality of this instrument. Construct validity could be determined by using factor analysis to strengthen the validity of the instrument before the final version of the instrument is compiled. Thus, application of a validation study with a confirmatory factor analysis will be recommended before future use of this instrument.

The instrument focus on the placement of undergraduate health professional students, the instrument could also benefit post graduate health professional students and therefore be considered in further research.

The intended population in this study is health professional students and their view of their CLEs, but the view of other role-players such as clinical facilitators; clinical staff, and other inter-professionals could also be an interesting topic for further research. Correlation studies could be performed between these role-players, for example.

After confirming the reliability and further validity, a trial or pilot study with the instrument could be done, measuring and comparing the CLEs of various clinical

settings. Further intervention studies may be an option should limitations in the CLE be highlighted in the instrument.

5.7 VALUE OF THE STUDY

This study contributes to much more than just the students' clinical learning experiences and competency levels, as there is also value for other role-players involved in the CLE. The value of this research was roundly discussed, considering the effect of a positive CLE on the other relevant role-players, such as the patients.

As indicated, professional governing bodies may benefit from this study by using this instrument for accreditation purposes, or to determine whether a clinical setting would present a positive CLE for students to train in.

The HSEIs' benefits may lie in a purposeful selection of clinical settings in which to place students for WIL. The instrument data can warn HSEIs about weaknesses or shortcomings in clinical settings that need strengthening, or areas which should be avoided. On the other hand, the instrument might also determine aspects in clinical settings that need to be sustained or rewarded for good work. Health Science Education Institutions could thus effortlessly and speedily make informed decisions about placement of students for high-quality clinical training and WIL.

The clinical settings may benefit from this instrument as well, by identifying areas where they could improve duties or sustainable placement of students in their environment. Uninterrupted placement of students in clinical settings could indirectly help address problems like staff shortages.

At the same time, there is benefit to the clinical staff in determining where or how they could improve their support to students in the complex caring environment. As previously identified, with effective support from clinical staff, the professional healthcare students could be an asset rather than a liability for clinical staff, assisting to carry the burden of holistic workload in the clinical settings.

Through the instrument's ability to identify gaps and shortcomings, current inter-professional relationships and teamwork by the various professions' healthcare students' could improve multi-disciplinary approaches to the clinical learning of inter-professional team members.

Clinical facilitators are seen as the link between the HSEI and the students. By determining whether a CLE is educationally grounded enough for students to be placed there, helps educators effectively support students in the CLE; improve the transfer learning climate; promotes good collaboration between role players, and identifies limitations in clinical facilities that could affect HSEIs' output of high-quality, competent professionals.

The acknowledgment of peer students' roles in the CLE would also benefit intra-professional teamwork. Peer students' integrated roles and responsibilities in the CLE make them more likely to do the right thing; indirectly improving the transfer of learning, and developing their clinical competence while delivering a higher level of patient care.

Students will always benefit from an improvement of the quality of their CLE, as a better CLE not only contributes to students' improved care output, but also improves their level of satisfaction with the clinical placement, leading to improved motivation and professional competency levels.

5.8 CONCLUSION

The need was identified for a new comprehensive instrument to measure CLEs appropriate for the training and learning of health professional students. The researcher was able to meet two objectives: Firstly, in Phase 1 of the Methodological study, to develop an instrument that would measure professional healthcare students' clinical learning environments, based on existing instruments; and secondly, to determine the face and content validity of the draft instrument by conducting a Delphi study as part of Phase 2.

By implementing the first two phases of a methodological study, the researcher was able to develop an instrument for measuring the CLE of students from various health sciences professions. The researcher is confident that a CLE can now be measured with a comprehensive instrument that includes all the aspects of a positive CLE for effective real-time patient-centred care. Secondly, the face and content validity of the instrument has been established by an expert healthcare professional panel, paving the way forward for further testing and validation by next-generation researchers.

This concludes the chapter and the findings of this study.

BIBLIOGRAPHY

- Abed, H., Mansur, M. & Saleh, B.A. 2015. Effect of organizational culture and business climate within the work environment on transfer of training from the perspective of workers in Palestinian government hospitals. *Arab Journal of Administration*, 35(1):459-490.
- Abraham, R., Ramnarayan, K., Vinod, P. & Torke, S. 2008. Students perceptions of learning environment in an Indian medical school. *Bio Medical Central Medical Education*, 20(8):1-5.
- Aktas, Y.Y. & Karabulut, N. 2016. A survey on Turkish nursing students' perception of clinical learning environment and its association with academic motivation and clinical decision making. *Nurse Education Today*, 36(1):124-128.
- Anderson, A., Cant, R. & Hood, K. 2014. Measuring students perceptions of interprofessional clinical placements: Development of the interprofessional clinical placement learning environment inventory. *Nurse Education in Practice*, 14(5):518-524.
- Armstrong, S.J. & Rispel, L.C. 2015. Social accountability and nursing education in South Africa. *Global Health Actions*, 8(1):1-8.
- Arpanantikul, M. & Pratoomwan, A. 2017. Clinical Learning Experiences of Second-Year Thai Nursing Students: A Phenomenological Study. *Pacific Rim International Journal Nursing Research*, 21(2):121-124.
- Atakro, C. A. & Gross, J. 2016. Preceptorship versus clinical teaching partnership: Literature review and recommendations for implementation in Ghana. *Hindawi Publishing Corporation Advances in Nursing, Open Access Pages*, 1(1):1-5.

- Babiker, A., Husseini, M., Nemri, A., Frayh, A., Juryyan, N., Faki, M.O., Assiri, A., Saadi, M., Shaikh, F. & Zamil, F. 2014. Health care professional development: Working as a team to improve patient care. *Sudanese Journal of Paediatrics*, 14(2):9-16.
- Balasubramanian, R. & Agarwal, D. 2012. Delphi Technique – A review. *International Journal of Public Health Dentistry*, 3(2):16-25.
- Baraz, S., Memarian, R. & Vanaki, Z. 2015. Learning challenges of nursing students in clinical environments: A qualitative study in Iran. *Journal of Education and Health Promotion*, 52(4):1-17.
- Bergjan, M. & Hertel, F. 2013. Evaluating students perception of their clinical placements – Testing the clinical learning environment and supervision and nurse teacher scale (CLES+T Scale) in Germany. *Nurse Educator Today*, 33(11):1393-1398.
- Beukes, S. & Nolte, A.G.W. 2013. Guidelines of value-sensitive clinical accompaniment in community health nursing. *Journal of Nursing Management*, 21(2):304-313.
- Biggs, J. & Tang, C. 2011. *Teaching for quality learning at university. What the student does*. New York: McGraw-Hill.
- Birks, M., Bagley, T., Park, T., Burkot, C. & Mills, J. 2017. The impact of clinical placement model on learning in nursing: A descriptive exploratory study. *Australian Journal of Advanced Nursing*, 34(3):16-23.
- Boateng, G.O., Neilands, T.B., Frongillo, E.A., Melgar-Quinonez, H.R. & Young, S.L. 2018. Best practices for developing and validating scales for health, social, and behavioural research: A primer. *Frontiers in Public Health*, 6(1):149-178.
- Botma, Y. & MacKenzie, M.J. 2016. Perspectives on transfer of learning by nursing students in primary healthcare facilities. *Journal of Nursing Education and Practice*, 6(11):104-110.

- Botma, Y., Brysiewicz, P., Chipps, J., Mthembu, S. & Phillips, M. 2014. *Creating stimulating learning opportunities*. Cape Town: Pearson.
- Botma, Y., Greeff, M., Mulaudzi, F.M. & Wright, S.C.D. 2010. *Research in Health Sciences*. Cape Town: Pearson.
- Botma, Y., Hurter, S. & Kotze, R. 2013. Responsibilities of nursing schools with regard to peer mentoring. *Nurse Education Today*, 33(1):808-813.
- Botma, Y., van Rensburg, G.H., Coetzee, I.M. & Heyns, T. 2013. A conceptual framework for educational design at modular level to promote transfer of learning. *Innovations in Education and Teaching International*, 52(5):499-509.
- Botma, Y., van Rensburg, G.H., Heyns, T. & Coetzee, I.M. 2013. A conceptual analysis of transfer of learning in Health Sciences Education. *African Journal of Physical, Health Education, Recreation and Dance*, 1(1):32-43.
- Braithwaite, J. 2018. Changing how we think about healthcare improvement. *Bio Medical Journal, Open Access Pages*, 1(1):1-5.
- Brink, H., van der Walt, C. & van Rensburg, G. 2012. *Fundamentals of Research Methodology for Healthcare Professionals*. 3rd ed. Cape Town: Juta.
- Brookfield, S.D. 1994. Self-directed learning, in YMCA George Williams College *ICE301 Lifelong learning, Unit 1 Approaching lifelong learning*. London: YMCA George Williams College. Available in the informal education archives. <https://infed.org/mobi/self-directed-learning/>. Date of access: 13 May 2020.
- Bruce, J. & Klopper, H. 2017. *Teaching and learning the practice of nursing*. 6th ed. Cape Town: Pearson.
- Brynildsen, G., Bjork, I.T., Berntsen, K. & Hestetun, M. 2014. Improving the quality of nursing students' clinical placements in nursing homes: An evaluation study. *Nurse Education in Practice*, 14(1):722-728.
- Bvumbwe, T., Malema, A. & Chipeta, M. 2015. Registered nurses' experiences with clinical teaching environment in Malawi. *Open Journal of Nursing*, 5(10):1-7.

- Chan, D.S.K. 2002. Associations between student learning outcomes from their clinical placement and their perceptions of the social climate of the clinical learning environment. *International Journal of Nursing Studies*, 39(1):517-524.
- Charleston, R., Hayman-White, C., Ryan, R. & Happel, B. 2007. Understanding the importance of effective orientation: what does this mean in psychiatric graduate nurse programs? *Australian Journal of Advanced Nursing*, 25(1):24-30.
- Chen, H., Holton III, E.F. & Bates, R. 2005. Development and Validation of the Learning Transfer System Inventory in Taiwan. *Human Resource Development Quarterly*, 16(1):55-84.
- Chen, J-Q., Hou, Z-J., Li, X., Lovelace, K.J., Liu, Y-L. & Wang, Z-L. 2016. The role of career growth in Chinese new employee's turnover process. *Journal of Career Development*, 43(1):11-25.
- Chuan, O.L. & Barnett, T. 2012. Student, tutor and staff nurse perceptions of the clinical learning environment. *Nurse Education in Practice*, 12(1):192-197.
- Cloete, I.S. & Jeggels, J. 2014. Exploring nurse preceptors' perceptions of benefits and support of and commitment to the preceptor role in the Western Cape Province. *Curationis*, 37(1):1281.
- Council on Higher Education (CHE). 2011. Council on Higher Education & South African Qualifications **Authority** 2011 Strategic Plans. *Higher Education, Science and technology*, <https://pmg.org.za/committee-meeting/12808/>. Date of access: 28 August 2018.
- Creswell, J.W. 2014. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 4th ed. California: SAGE Publications, Inc.
- D'Souza, M.S., Karkada, S.N., Parahoo, K. & Venkatesaperumal, R. 2015. Perception of and satisfaction with the clinical learning environment among nursing students. *Nurse Education Today*, 35(1):833-840.

- Dadgaran, I., Shirazi, M., Mohammadi, A. & Ravari, A. 2016. Developing an instrument to measure effective factors on Clinical Learning. *Journal of Advances in Medical Education & Professionalism*, 4(3):122-129.
- Department of Health. 1997. *White paper for the transformation of the health system in South Africa*. National Department of Health. Pretoria.
- Department of Health. 2011. *Annual Report 2011/12*. Pretoria: Government Printers.
- Department of Health. 2012. *National Strategic Plan for Nurse Education, Training and Practice 2012/13 – 2016/17*. Pretoria: Government Printers.
- Department of Health. 2013. *Strategic Plan for Nurse Education, Training and Practice 2012/13 – 2016/17*. Pretoria: Government Printers.
- Department of Health. 2015. *Ethics in health research: Principles, processes and structures*. Pretoria: Government Printers.
- Dewey, G. 2016. *What does “and Health Science” mean?* <https://www.acphs.edu/blog/what-does-and-health-sciences-mean>. Date of access: 28 August 2018.
- Dimitriadou, M., Papastavrou, E., Efstathiou, G. & Theodorou, M. 2015. Baccalaureate nursing students' perceptions of learning and supervision in the clinical environment. *Nursing and Health Science*, 17(1):236-242.
- Dolamo, D.L. 2018. Maintaining nursing practice standards while changing with times: SANC perspective. *Bio Medical Journal of Scientific & Technical Research*, 4(5):1-6.
- Donavan, P. & Darcy, D.P. 2011. Learning transfer: the views of practitioners in Ireland. *International Journal of Training and Development*, 15(2):121-139.
- Donia, M.B.L., O'Neill, T.A. & Brutus, S. 2018. The longitudinal effects of peer feedback in the development and transfer of students teamwork skills. *Learning and Individual Differences*, 61(1):87-98.

- Du Plooy-Cilliers, F., Davis, C. & Bezuidenhoudt, R. 2014. *Research Matters*. Cape Town: Juta.
- Eastland, T.Y., Morrow, M.R. & Davis, J.H. 2018. Effectiveness of institutional strategies to recruit and retain minority nurses: a systemic review protocol. *JBI Database of Systematic Reviews and Implementation*, 16(7):1490-1494.
- Engelbrecht, N., Heyns, T. & Coetzee, I.M. 2017. South African undergraduate nursing students experience of intra-professional violence. *Gender and Behaviour*, 15(1):8492-8508.
- Engstrom, M., Lofmark, A., Vae, K.J.U. & Martensson, G. 2017. Nursing students perceptions of using the Clinical Education Assessment tool AssCE and their overall perceptions of the clinical learning environment – A cross-sectional correlational study. *Nurse Education Today*, 51(1):63-67.
- Falzarano, M. & Pinto Zipp, S. 2013. Seeking consensus through the use of the Delphi technique in health sciences research. *Journal Allied Health*, 42(2):99-105.
- Flott, E.A. & Linden, L. 2015. The clinical learning environment in nursing education: a concept analysis. *Journal of Advanced Nursing*, 72(3):501-513.
- Gaede, B. & Versteeg, M. 2011. The state of the right to health in rural South Africa. *South African Health Review*, 2011(1):99-106.
- Giannarou, L. & Zervas, E. 2014. Using Delphi technique to build consensus in practice. *International Journal of Business Science and Applied Management*, 9(2):66-82.
- Govina, O., Vlachou, E., Lavdaniti, M., Kalemikerakis, I., Margari, N., Galanos, A. & Kavga, A. 2017. Psychometric testing of the student evaluation of clinical educational environment inventory in Greek nursing students. *Global Journal of Health Science*, 9(5):241-252.

- Green, R.A. 2014. The Delphi Technique in Educational Research. *SAGE Open*, 1(1):1-8.
- Grove, S.K., Burns, G. & Gray, J.R., 2013. *The practice of nursing research: Appraisal, synthesis, and generation of evidence*. 7th ed. St Louis: Elsevier.
- Gruppen, L.D., Mangrulkar, R.S. & Kolars, J.C. 2012. The promise of competency-based education in the health professions for improving global health. *Bio Medical Central Human Resources for Health*, 10(1):43-54.
- Gustafsson, M., Blomberg, K. & Holmefur, M. 2015. Test-retest reliability of the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) scale. *Nurse Education in Practice*, 15(1):253-257.
- Habibi, A., Sarafrazi, A. & Izadyar, S. 2014. Delphi Technique Theoretical Framework in Qualitative Research. *The International Journal of Engineering and Science*, 3(4):8-13.
- Hakojarvi, H., Salimen, L. & Suhonen, R. 2014. Health care students' personal experiences and coping with bullying in clinical training. *Nurse Education Today*, 34(1):138-144.
- Hallin, K. & Kiessling, A. 2016. A safe place with space for learning: Experiences from an interprofessional training ward. *Journal of Interprofessional Care*, 30(2):141-148.
- Hasske, E., Beil, M. & Keller, K. 2017. Competency-based Education and Training of medical staff. A programm of the Medical Academy Waldbreitbach: Concept-Implementation-Materials. *GMS Journal for Medical Education*, 34(4):online.
- Henderson, A., Cooke, M., Creedy, D.K. & Walker, R. 2012. Nursing students' perceptions of learning in practice environments: a review. *Nurse Education Today*, 32(1):299-302.

- Hinken, T.R. 1995. A Review of Scale Development Practices in the Study of Organizations. *Journal of Management*, 21(5):967-988.
- Hooven, K. 2014. Evaluation of instruments Developed to Measure the Clinical Learning Environment An integrative Review. *Nurse Educator*, 36(6):316-320.
- Hooven, K. 2015. Nursing students' qualitative experiences in medical-surgical clinical learning environment: A cross-cultural integrative review. *Journal of Nursing Education*, 54(8):421-431.
- Hooven, K.J. 2016. *Development and testing of the collaboration in the clinical learning environment (CCLE) tool*. Pennsylvania: Villanova University (Thesis-PhD).
- Hooven, K. 2017. Development and Testing of the Collaboration in the Clinical Learning Environment Tool. *Journal of Nursing Measurement*, <http://dx.doi.org/10.1891/1061-3749.25.2.353> Date of access: 7 May 2019.
- Horwitz, S. 2011. The nurse in the university: A history of university education for south African nurses: A case study of the University of the Witwatersrand. *Nursing Research and Practice*. Available from: <http://dx.doi.org/10.1155/2011/813270> Date of access: 31 January 2019.
- HPCSA (Health Professions Council of South Africa). 2014. *Core competencies for undergraduate students in clinical associate, dentistry and medical teaching and learning programmes in South Africa*. <https://www.hpcsa.co.za/?contentId=0&menuSubId=47&actionName=For%20Professionals> Date of access: 12 March 2019.
- HPCSA (Health Professions Council of South Africa). 2018. *Annual Report*. <https://www.hpcsa.co.za/Uploads/Publications%202019/Annual%20Report/HPCSA%20Annual%20Report%202018-19%2010102019.pdf> Date of access: 3 May 2019.
- Hsu, C. & Sandford, B.A. 2007. The Delphi Technique: Making Sense of Consensus. *Practical Assessment, Research & Evaluation*, 12(10):1-8.

- Hugo, L. & Botma, Y. 2019. Looking beneath the surface of a preceptor-training programme through a realist evaluation. *Journal of Evaluation and Program Planning*, 73(1):195-203.
- Hugo, L. 2016. *Development and testing of a tool to measure the supportive role of nursing preceptors*. Bloemfontein: University of the Free State (Thesis- M degree).
- Hugo, L. 2018. *Development and implementation of a training programme for preceptors: A realist evaluation*. Bloemfontein: University of the Free State (Thesis-PhD).
- Hugo, L., Botma, Y. & Raubenheimer, J.L. 2018. Monitoring preceptors' supportive role: A measuring instrument for increased accountability. *Nurse Education Today*, 67(1):83-89.
- Humphrey-Murto, S., Varpio, L., Gonsalves, C. & Wood, T.J. 2017. Using consensus group methods such as Delphi and Nominal Group in medical education. *Medical Teacher*, 39(1):14-19.
- Hyde, S., Hannigan, A., Dornan, T. & McGrath, D. 2018. Medical school clinical placements – the optimal method for assessing the clinical educational environment from a graduate entry perspective. *Bio Med Central Medical Education*, 18(7):1-8.
- Institute for Health Metrics and Evaluation, Human Development Network, The World Bank. 2013. *The Global Burden of Disease: Generating Evidence, Guiding Policy – Sub-Saharan Africa Regional Edition*. Seattle, WA: IHME.
- Jacobs, A.C., MacKenzie, M.J. & Botma, Y. 2013. Learning experiences of student nurses on a healthcare train in the Free State Province of South Africa. *African Journal of Nursing and Midwifery*, 15(1):3-14.

- Jalili, M., Hejri, S.M., Ghalandari, M., Moradi-Lakeh, M., Mirzazadeh, A. & Roff, S. 2014. Validating Modified PHEEM Questionnaire for Measuring Educational Environment in Academic Emergency Departments. *Iranian Medicine*, 17(5):372-377.
- Jansson, I. & Ene, K.W. 2016. Nursing students's evaluation of quality indicators during learning in clinical practice. *Nurse Education in Practice*, 20(1):17-22.
- Jeppesen, K.H., Christiansen, S. & Frederiksen, K. 2017. Education of student nurses – A systematic literature review. *Nurse Education Today*, 55(1):112-121.
- Jones, J.M. 2004. Nutritional methodology: Development of a nutritional screening or assessment tool using a multivariate technique. *Nutrition*, 20(3):298-306.
- Kaphagawani, N.C.C. 2016. *Nursing students clinical learning experiences in selected colleges in Malawi: A model to facilitate clinical learning*. Potchefstroom: North-West University (Thesis-PhD).
- Kedge, S. & Appleby, B. 2010. Promoting curiosity through the enhancement of competence. *British Journal of Nursing*, 19(9):584-587.
- Kilty, C., Wiese, A., Bergin, C., Flood, P., Fu, N., Horgan, M., Higgins, A., Maher, B., O' Kane, G., Prihodova, L., Slattery, D., Stoyanov, S. & Bennett, D. 2017. A national stakeholder consensus study of challenges and priorities for clinical learning environments in postgraduate medical education. *Bio Medical Central Medical Education*, 17(1):226-334.
- Kivunja, C. & Kuyini, A.B. 2017. Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education*, 6(5):26-41.
- Koh, W.M.S. 2016. Management of work place bullying in hospital: A review of the use of cognitive rehearsal as an alternative management strategy. *International Journal of Nursing Sciences*, 3(1):213-222.

- Krupat, E., Borges, N.J., Brower, R.D., Haidet, P.M., Schrot, W.S., Fleenor, T.J. & Uitjehaage, S. 2017. The Educational Climate Inventory: Measuring Students' Perceptions of the Preclerkship and Clerkship Settings. *Academic Medicine*, 92(17):1757-1764.
- Langins, M. & Borgermans, L. 2015. *Strengthening a competent health workforce for the provision of coordinated/integrated health services*. World Health Organization Regional Office for Europe, <http://www.euro.who.int/data/assets/pdf/0010/288253/HWF-Competencies-Paper-160915-final.pdf>. Date of access: 01 October 2019.
- Lee, C.T. & Doran, D.M. 2017. The role of interpersonal relations in healthcare team communication and patient safety: A Proposed model of interpersonal process in teamwork. *Canadian Journal of Nursing Research*, 49(2):75-93.
- Lee, J.J., Clarke, C.L. & Carson, M.N. 2018. Nursing students' learning dynamics and influencing factors in clinical contexts. *Nurse Education in Practice*, 29(1):103-109.
- Lekalakala-Mokgele, E. & Caka, E.M. 2015. Facilitative and obstructive factors in the clinical learning environment: Experiences of pupil enrolled nurses. *Curationis*, 38(1):1-7.
- Lethale, S.P., Makhado, L. & Koen, M.P. 2019. Factors influencing preceptorship in clinical learning for an undergraduate nursing programme in the North West Province of South Africa. *International Journal of Africa Nursing Sciences*, 10(1):19-25.
- Lindfors, K. & Junntila, K. 2014. The effectiveness of orientation programs on professional competence and organizational commitment of newly graduated nurses in specialized health care: a systematic review protocol. *Joanna Briggs Institute Database of Systematic Reviews and Implementation Reports*, 12(5):2-14.

- Liu, M., Gu, K., Wong, T.K.S., Luo, M.Z. & Chan, M.Y. 2015. Perceived stress among Macao nursing students in the clinical learning environment. *International Journal of Nursing Sciences*, 2(1):128-133.
- LoBiondo-Wood, G. & Haber, J. 2010. *Nursing Research, Methods and Critical Appraisal for Evidence-Based Practice*. 7th ed. St.Louis: Mosby-Elsevier.
- Lovecchio, C.P., Dimattio, M.J.K. & Hudacek, S. 2015. Predictors of Undergraduate Nursing Student Satisfaction with Clinical Learning Environment: A Secondary Analysis. *Nursing Education Perspectives*, 1(1):252-254.
- Mabuda, B.T., Potgieter, E. & Alberts, U.U. 2008. Student nurses' experience during clinical practice in the Limpopo Province. *Curationis*, 31(1):19-27.
- Mannix, J., Wilkes, L. & Luck, L. 2009. Key stakeholders in clinical learning and teaching in Bachelor of Nursing programs: A discussion paper. *Contemporary Nurse*, 32(1-2):59-68.
- Mansutti, I., Saiani, L., Grassetti, L. & Palese, A. 2017. Instruments evaluating the quality of the clinical learning environment in nursing education: A systematic review of psychometric properties. *International Journal of Nursing Studies*, 68(1):60-72.
- Mantzourani, E., Desselle, S., Le, J., Lonie, J.M. & Lucas, C. 2019. The role of reflective practice in health care professions: Next steps for pharmacy education and practice. *Research in Social and Administrative Pharmacy*, 15(12):1476-1479.
- Mburu, G. & George, G. 2017. Determining the efficacy of national strategies aimed at addressing challenges facing health personnel working in rural areas in KwaZulu-Natal, South Africa. *African Journal of Primary Health Care & Family Medicine*, 9(1):a1355. <https://doi.org/10.4109/phcfm.v9i1.1355>. Date of access: 26 Oct. 2017.

- McCormack Tutt, S. A. 2019. *Healthcare students' abilities to translate interprofessional education to collaborative practice*. Armidale:University of New England (Thesis-PhD)
- Mellish, J. 2016. *Teaching and Learning the practice of nursing*. 6th ed. Cape Town: Pearson.
- Merriam-Webster's Medical Dictionary. 2019. *Develop*. <https://www.merriam-webster.com/dictionary/develop> Date of access: 06 January 2019.
- Meyer, R., van Schalkwyk, S.C. & Prakaschandra, R. 2016. The operating room as a clinical learning environment: An exploratory study. *Nurse Education in Practice*, 18(1):60-72.
- Meyer, S.M., Naude, M., Shangase, N.C. & van Niekerk, S.E. 2009. *The Nursing Unit Manager: A Comprehensive Guide*. 3rd ed. Johannesburg: Heinemann.
- Morgado, F.F.R., Meireles, J.F.F., Neves, C.M., Amaral, A.C.S. & Ferreira, M.E.C. 2017. Scale development: ten main limitations and recommendations to improve future research practices. *Psicologia: Reflexao e Critica*, 30(3):1-20.
- Morphet, J., Hood, K., Cant, R., Baulch, J., Gilbee, A. & Sandry, K. 2014. Teaching teamwork: an evaluation of an interprofessional training ward placement for health care students. *Advances in Medical Education and Practice*, 5(1):197-204.
- Mosia, S.J. & Joubert, A. 2020. Primary healthcare practice learning environment: A description of students' perspectives. *International Journal of Africa Nursing Sciences*, 13(1):100230.
- Msiska, G., Smith, P. & Fawcett, T. 2014. The "lifeworld" of Malawian undergraduate student nurses: The challenge of learning in resource poor clinical settings. *International Journal of Africa Nursing Science*, 1(1):35-42.

- Muraraneza, C. & Mshali, G.N. 2018. Implementation of competency based curriculum in pre-service nursing education: Middle range theory. *International Journal of Africa Nursing Sciences*, 8(1):53-58.
- Muthathi, I.S., Thurling, C.H. & Armstrong, S.J. 2017. Through the eyes of the student: Best practices in clinical facilitation. *Curationis*, 40(1):1-8.
- Naidoo, K.L. van Wyk, J.M. & Adhikari, M. 2017. The learning environment of paediatric interns in South Africa. *Bio Medical Central Medical Education*, 17(1):1-10.
- Nancarrow, S.A. 2015. Six principles to enhance health workforce flexibility. *Human Resources for Health*, 13(9):1-12.
- Nemoto, T. & Beglar, D. 2014. Developing Likert-scale questionnaires. In N. Sonda & A. Krause (Eds.), *Journal of Accelerated Learning and Teaching 2013 Conference Proceedings*. Tokyo: JALT.
- Nepal, B., Taketomi, K., Ito, Y.M., Kohanawa, M., Kawabata, H., Tanaka, M. & Otaki, J. 2016. Nepalese undergraduate nursing students; perceptions of the clinical learning environment, supervision and nurse teachers: A questionnaire survey. *Nurse Education Today*, 39(1):181-188.
- Nielsen, M.B., Indregard, A.R., Krane, L. & Knardahl, S. 2019. Workplace bullying and medical certified sickness absence: Direction of associations and the moderating role of leader behavior. *Frontiers in Psychology*, 10(767):1-8.
- Nursing Education Stakeholders (NES) Group, 2012. A proposed model for clinical nursing education and training in South Africa. In: R.L. Uys & H.C. Klopper, eds. *Trends in Nursing*. Pretoria: FUNDISA, 1(1):49-58.
- Nursing Summit Organizing Committee & Ministerial Task Team, 2012. The nursing summit of 2011. In: L.R. Uys & H.C. Klopper, eds. *Trends in Nursing*. Pretoria: FUNDISA, 1(1):33-48.

- O'Mara, L., McDonald, J., Gillespie, M., Brown, H., & Miles, L. 2014. Challenging clinical learning environments: Experiences of undergraduate nursing students. *Nurse Education in Practice*, 14(1):208-213.
- Pacifico, J.L., van der Vleuten, C.P.M., Muijtjens, A.M.M., Sana, E.A. & Heeneman, S. 2018. Cross-validation of a learning climate instrument in a non-western postgraduate clinical environment. *Bio Medical Central Medical Education*, 18(1):1-7.
- Palese, A., Dante, A. & Tonzar, L. 2014. The N2N instrument to evaluate healthy work environments: an Italian validation. *International Archives of Occupational and Environmental Health*, 87(1):217-228.
- Papastavrou, E., Dimitriadou, M. & Tsangari, H. 2016. Psychometric testing of the Greek version of the Clinical Learning Environment-Teacher (CLES-T). *Global Journal of Health Sciences*, 8(5):59-71.
- Papastavrou, E., Dimitriadou, M., Tsangari, H. & Andreou, C. 2016. Nursing students' satisfaction of the clinical learning environment: a research study. *Bio Medical Central Nursing*, 15(44):1-10.
- Papastavrou, E., Lambrinou, E., Tsangari, H., Saarikoski, M. & Leino-Kilpi, H. 2010. Student nurses experience of learning in the clinical environment. *Nurse Education in Practice*, 10(1):176-182.
- Paré, G. & Kitsiou, S. 2017. Chapter 9 Methods for literature reviews. In: Lau F, Kuziemsky C, editors. *Handbook of eHealth Evaluation: An Evidence-based Approach*. Victoria: University of Victoria. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK481583/> Date of access: 16 January 2019.
- Parson, L., Childs, B. & Elzie, P. 2018. Using Competency-Based Curriculum Design to Create a Health Professions Education Certificate Program the Meets the needs of Students, Administrators, Faculty and Patients. *Health Professions Education*, 4(1):207-217.

- Pereira-Lima, K., Silva-Rodrigues, A.P.C., Marucci, F.A.F., Osorio, F. L., Crippa, J.A. & Loureiro, R. 2018. Cross-cultural adaptation and psychometric assessment of a Brazilian-Portuguese version of the Resident Questionnaire. *Plos one*, 1(1):1-9.
- Phillips, K.F., Mathew, L., Aktan, N. & Catano, B. 2017. Clinical education and student satisfaction: An integrative literature review. *International Journal of Nursing Sciences*, 4(1):205-213.
- Phuma-Ngaiyaye, E., Bvumbwe, T. & Chipeta, M.C. 2017. Using preceptors to improve nursing students' clinical learning outcomes: A Malawian students' perspective. *International Journal of Nursing Sciences*, 4(1):164-168.
- Polit, D.F. & Beck, C.T. 2012. *Nursing research: generating and assessing evidence for nursing practice*. 9th ed. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Polit, D.F. & Beck, C.T. 2018. *Essentials of nursing research: Appraising evidence for nursing practice*. 9th ed. Philadelphia: Wolters Kluwer.
- Rajeswaran, L. 2016. Clinical experiences of Nursing students at a selected Institute of Health Sciences in Botswana. *Health Science Journal*, 10(6):471-476.
- Rispel, L.C. 2015. Transforming nursing policy, practice and management in South Africa. *Global Health Action*, 8(1):1-4.
- Rosen, M.A., DiazGranados, D., Dietz, A.S. Thompson, D., Pronovost, P.J. & Weaver, S. J. 2018. Key discoveries enabling safer, high-quality care. *American Psychologist*, 73(4):433-450.
- Saarikoski, M., Leino-Kilpi, H. & Warne, T. 2002. Clinical learning environment and supervision: testing a research instrument in an international comparative study. *Nurse Education Today*, 22(1):340-349.

- Saarikoski, M., Warne, T., Kaila, P. & Leino-Kilpi, H. 2009. The role of the nurse teacher in clinical practice: An empirical study of Finnish student nurse experiences. *Nurse Education Today*, 29(6):595-600.
- Salamonson, Y., Bourgeois, S., Everett, B., Weaver, R., Peters, K. & Jackson, D. 2011. Psychometric testing of the abbreviated Clinical Learning Environment Inventory (CLEI-19). *Journal of Advanced Nursing*, 67(12):2668-2676.
- Sand-Jecklin, K. 2000. Evaluating the student Clinical Learning Environment: Development and validation of the SECEE Inventory. *Southern Online Journal of Nursing Research*, 4(1):online.
- Scotland, J. 2012. Exploring the Philosophical Underpinings of Research: Relating Ontology and Epistemology to the Methodology and Methods of the Scientific, Interpretive, and Critical Research Paradigms. *English Language Teaching*, 5(9):9-16.
- Scotti, D.J. & Harmon, J. 2014. Linkages between organization climate and work outcomes: perceptual differences among health services professionals as a function of customer contact intensity. *Journal of Health and Human Services Administration*, 1(1):418-459.
- Sercekus, P. & Baskale, H. 2016. Nursing Students perceptions about clinical learning environment in Tukey. *Nurse Education in Practice*, 17(1):134-138.
- Serrano-Gallardo, P., Martinez_Marcos, M., Espejo_Matorrales, F., Arakawa, T., Magnabosco, G.T. & Pinto, I.C. 2016. Factors associated to clinical learning in nursing students in primary health care: an analytical cross-sectional study. *Revista Latino-Americana de Enfermagem*, 24(1):1-10.
- Sethi, A. & Khan, A. 2018. IS the dental clincial learning environment suitable? A survey of Khyber Pakhtunkhwa, Pakistan. *Journal of the Pakistan Medical Association*, 68(3):359-363.

- Shivers, E., Hasson, F. & Slater, P. 2017. Pre-registration nursing student's quality of practice learning: Clinical learning environment inventory (actual) questionnaire. *Nurse Education Today*, 55(1):58-64.
- Smith, C.R., Gillespie, G.L., Brown, K.C. & Grubb, P.L. 2016. Seeing Students Squirm: Nursing Students' Experiences of Bullying Behaviours During Clinical Rotations. *Journal of Nursing Education*, 55(9):505-513.
- Smith, S.A. 2012: Nurse Competence: A Concept Analysis. *International Journal of Nursing Knowledge*, 23(3):172-182.
- Snellenberger, S. & Mahan, J.M. 1982. A factor analytic study of teaching in off-campus general clerkship. *Medical Education*, 16(3):151-155.
- Srimannarayana, M. 2016. An Exploratory Study of Training Transfer Climate in India. *International Journal of Business and Management*, 11(8):263-272.
- Sundler, A.J., Bjork, M., Bisholt, B., Ohlsson, U., Engstrom, A.K. Gustafsson, M. 2014. Students nurses' experiences of the clinical learning environment in relation to the organisation of supervision: A questionnaire survey. *Nurse Education Today*, 34(4):661-666.
- Talwalkar, J.S., Fahs, D.B., Kayingo, G., Wong, R., Jeon, S. & Honan, L. 2016. Readiness for interprofessional learning among healthcare professional students. *International Journal Medical Education*, 7(1):144-148.
- Tanner, C.A. 2006. Thinking like a nurse: a research-based model of clinical judgment in nursing. *Journal of Nursing Education*, 45(6):204-211.
- Thangaratinam, S. & Redman, C.W.E. 2005. The Delphi technique. *Royal College of Obstetricians and Gynaecologist*, 7(1):120-125.
- Thomson, R., Docherty, A. & Duffy, R. 2017. Nursing students' experiences of mentorship in their final placement. *British Journal of Nursing*, 26(9):514-521.
- Van Lankveld, W., Maas, M., van Wijchen, J., Visser, V. & Staal, J.B. 2019. Self-regulated learning in physical therapy education: a non-randomized

- experimental study comparing self-directed and instruction-based learning. *Bio Medical Central Medical Education*, 19(50):1-9.
- Waggoner, J., Carline, J.D. & Durning, S.J. 2016. Is there a consensus on consensus methodology? Descriptions and recommendations for future consensus research. *Academic medicine*, 91(5):663-668.
- Weller, J., Boyd, M. & Cumin, D. 2014. Teams, tribes and patient safety: overcoming barriers to effective teamwork in healthcare. *Postgraduate Medical Journal*, 90(1):149-154.
- Wen, M.L. & Lin, D.Y. 2014. How supportive transfer climate affects individuals motivation to training transfer. *International Journal of Learning & Development*, 4(1):1-15.
- Williamson, G.R., Callaghan, L., Whittlesea, E. & Heath, V. 2010. Improving student support using Placement Development Teams: staff and student perceptions. *Journal of Clinical Nursing*, 20(1):828-836.
- World Health Organisation (WHO). 2010. Framework for Action on Interprofessional Education & Collaborative Practice. *World Health Organisation (WHO)*, Geneva. Available from: <http://apps.who.int/iris/bitstream/10665/70185/1/WHOHPN10.3eng.pdf>. Date of access. 20 September 2020.
- World Health Organisation (WHO). 2012. *Governance for health in the 21st century*. Available: http://www.euro.who.int/_data/assets/pdf_file/0019/171334/RC62BD01-Governance-for-Health-Web.pdf. Date of access. 20 September 2020.
- World Health Organisation (WHO). 2013. Transforming and scaling up health professionals' education and training: World Health Organisation guidelines 2013. Geneva, WHO Document Production Services.
- World Health Organisation (WHO). 2015. *WHO Global strategy on people-centred and integrated health services*. Geneva, WHO Document Production Services.

World Health Organisation (WHO). 2016. *Global strategy on human resources for health: Workforce 2030*. Geneva, WHO Document Production Services.

World Health Organisation (WHO). 2017. *World Health statistics 2017: monitoring health for the SDGs, Sustainable Development Goals*. Geneva, WHO Document Production Services.

Yun, S., Kang, J., Lee, Y. & Yi, Y. 2014. Work environment and workplace bullying among Korean intensive care unit nurses. *Asian Nursing Research*, 8(1):219-225.

ADDENDUM A1

Ethical clearance Phase 1



Health Sciences Research Ethics Committee

23-Jul-2019

Dear Mrs Hanlie Jordaan

Ethics Clearance: **Development of an instrument to measure the clinical learning environment in health sciences**

Principal Investigator: **Mrs Hanlie Jordaan**

Department: **School of Nursing Department (Bloemfontein Campus)**

APPLICATION APPROVED

Please ensure that you read the whole document

With reference to your application for ethical clearance with the Faculty of Health Sciences, I am pleased to inform you on behalf of the Health Sciences Research Ethics Committee that you have been granted ethical clearance for your project.

Your ethical clearance number, to be used in all correspondence is: **UFS-HSD2019/0284/3007**

The ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We request that any changes that may take place during the course of your research project be submitted to the HSREC for approval to ensure we are kept up to date with your progress and any ethical implications that may arise. This includes any serious adverse events and/or termination of the study.

A progress report should be submitted within one year of approval, and annually for long term studies. A final report should be submitted at the completion of the study.

The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act, No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

For any questions or concerns, please feel free to contact HSREC Administration: 051-4017794/5 or email EthicsFHS@ufs.ac.za.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours Sincerely

Dr. SM Le Grange

Chair : Health Sciences Research Ethics Committee

Health Sciences Research Ethics Committee

Office of the Dean: Health Sciences

T: +27 (0)51 401 7795/7794 | E: ethicsfhs@ufs.ac.za

IRB 00006240; REC 230408-011; IORG0005187; FWA00012784

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www.ufs.ac.za



ADDENDUM A2

Ethical clearance Phase 2



Health Sciences Research Ethics Committee

05-May-2020

Dear Mrs Hanlie Jordaan

Ethics Number: UFS-HSD2019/0284/3007

Ethics Clearance: **Development of an instrument to measure the clinical learning environment in health sciences**

Principal Investigator: **Mrs Hanlie Jordaan**

Department: **School of Nursing Department (Bloemfontein Campus)**

SUBSEQUENT SUBMISSION APPROVED

With reference to your recent submission for ethical clearance from the Health Sciences Research Ethics Committee, I am pleased to inform you on behalf of the HSREC that you have been granted ethical clearance for your request as stipulated below:

Subsequent Submission:

Instrument and Delphi Matrix of participants for approval of phase 2

The HSREC functions in compliance with, but not limited to, the following documents and guidelines: The SA National Health Act, No. 61 of 2003; Ethics in Health Research: Principles, Structures and Processes (2015); SA GCP(2006); Declaration of Helsinki; The Belmont Report; The US Office of Human Research Protections 45 CFR 461 (for non-exempt research with human participants conducted or supported by the US Department of Health and Human Services- (HHS), 21 CFR 50, 21 CFR 56; CIOMS; ICH-GCP-E6 Sections 1-4; The International Conference on Harmonization and Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH Tripartite), Guidelines of the SA Medicines Control Council as well as Laws and Regulations with regard to the Control of Medicines, Constitution of the HSREC of the Faculty of Health Sciences.

For any questions or concerns, please feel free to contact HSREC Administration: 051-4017794/5 or email EthicsFHS@ufs.ac.za.

Thank you for submitting this request for ethical clearance and we wish you continued success with your research.

Yours Sincerely

Dr. SM Le Grange
Chair : Health Sciences Research Ethics Committee

Health Sciences Research Ethics Committee

Office of the Dean: Health Sciences

T: +27 (0)51 401 7795/7794 | E: ethicsfhs@ufs.ac.za

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ADDENDUM B

Informed consent

UNIVERSITY OF THE FREE STATE

SCHOOL OF NURSING

INFORMED CONSENT FORM TO PARTICIPATE IN DELPHI STUDY

RESEARCH TITLE: Development of an instrument to measure the clinical learning environment in health science.

RESEARCHER: Hanlie Jordaan

Mobile number: 084 575 4441

Dear expert

I, Hanlie Jordaan, would like to invite you to participate in my research study for my Master's degree. The study is about the development of a comprehensive instrument to measure the clinical learning environment. On completion of this study, I will have developed a new instrument which is ready for testing. The Health Sciences Research Ethics Committee of the University of the Free State, had granted ethical approval (UFS-HSD2019/0284/3007).

The clinical learning environment (CLE) includes the clinical area where students work during their experiential learning. The quality of the area set the trend for health science students' learning. The atmosphere of the clinical setting, teamwork between role players, the workload and the learning opportunities the students experience are essential for them to transfer their learning and become competent practitioners. By participating in this research, you can assist me to validate a face and content validity instrument that can measures the current state of the clinical learning environments.

A quantitative methodological design was used to develop the instrument. A Delphi technique will be used to ensure face and content validity of the new developed instrument. This technique will measure the expert's judgments on the items captured in the instrument. As expert, you will need to appraise the items and themes of the instrument according to their relevance to the CLE.

You are selected as an expert to participate in answering a series of feedback rounds until consensus is reached on all items. This study depends on your willingness to participate in all the rounds.

Participation is voluntary and you may withdraw from the study at any time. Anonymity of the expert is enhanced by sending your feedback via email directly to me.

Responses received will be dealt in a confidential manner. The researchers will summarise the feedback of all participants for the next round. Feedback on responses will be disseminated in a collective manner. Only the research team will have access to individual's responses. Instruments and data will be kept in a lock fireproof cabinet for safekeeping.

The expectations that I have as researcher, is that if you volunteer to participate, that you will commit yourself for the entire series of rounds and to complete the instrument truthfully.

There is no cost involved and there will be no remuneration for your participation. The results may be published in scientific journals and conference proceedings.

By completing the instrument, you are agreeing that you have read and understood the terms and conditions of the research and you are giving consent to participate in this research.

Please contact me for any further information at:

Email: jordaanhanlie@gmail.com

Cell phone (+27) 84 575 4441

Any complaints can be reported to the Secretariat and Chair of the University of the Free State Health Sciences Research Ethics Committee at (051) 401 7794. You are also welcome to contact my supervisor, Dr L Hugo at (051) 401 9165 or hugoL1@ufs.ac.za.

Thank you for your positive consideration towards my request.

Yours sincerely,

Hanlie Jordaan

ADDENDUM C1

***Developed instrument version 1
for Round 1***

Dear Expert

Thank you for your willingness to participate in this study.

This is the first round in the Delphi study. Please find attached the informed consent letter and the questionnaire.

Please read the letter and complete the questionnaire. The questionnaire will take approximately 20 minutes of your time.

Send the completed questionnaire back to me by the 26th of May 2020.

Your contribution to this study is very important.

Kind regards

Hanlie Jordaan

Participant nr _____

By completing this questionnaire, you are consenting to participate in the research. Please evaluate the clinical learning environment where you were placed during this month. Your participation is voluntary and anonymous.

Biographic data				
Indicate your profession by ticking of the following:	Biokineticist	Dentist	Dietitian	
	Nursing	Occupational therapist	Optometrist	
	Paramedic	Physiotherapist	Medical physician	
	Pharmacist	Radiographer	Other	
	Other:			
Indicate your highest professional qualification	Bachelors	Honours	Masters	PhD
Indicate the number of years' experience in the clinical learning environment.				
Total number of hours spent with students per week.	30 min - 2 hours	2 - 6 hours	> 6 hours	

Read each statement and indicate with a X your chosen option

Atmosphere in the clinical setting

In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – regarding the atmosphere in the clinical setting?		ESSENTIAL	UN-CERTAIN	NOT NEEDED
Item 1	I was welcomed to this unit.			
Item 2	I was orientated to the physical environment.			
Item 3	Facility / Equipment were well maintained.			
Item 4	Necessary resources were available to perform tasks well.			
Item 5	The unit was well organised.			
Item 6	Supervisors were approachable.			
Item 7	There was a reciprocal respectful relationship between the supervisors and myself.			
Item 8	There was unity between healthcare professionals in the unit.			
Item 9	There was a sense of trust among healthcare professionals.			
Item 10	Health science professionals had a positive attitude towards me.			
Item 11	I was able to build positive relationships with all the healthcare professionals.			
Item 12	I freely participated in discussions on patient management.			
Item 13	Health science professionals considered innovative ideas regarding patient care.			
Item 14	Health science professionals were professional in their actions.			

Item 15	Health science professionals demonstrated a person-centred care approach.			
Item 16	The unit is all about getting the job done.			
Item 17	I experience bullying in this unit.			
Item 18	I have a sense of work satisfaction after this clinical rotation.			
Any additional comments:				
Teamwork in the clinical setting				
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – regarding teamwork in the clinical setting.		ESSENTIAL	UN-CERTAIN	NOT NEEDED
Item 19	Various health science professionals valued each other.			
Item 20	There was good communication among healthcare professionals.			
Item 21	There was shared decision making among the health science professionals.			
Item 22	I had a good working relationship with all the healthcare professionals.			
Item 23	I felt part of the health science professional team.			
Item 24	I was valued as a health science professional team member.			
Item 25	Health science professionals collaborated to support my learning.			
Item 26	Clinical facilitators shared their educational expertise with the team.			

In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – regarding teamwork in the clinical setting.		ESSENTIAL	UN-CERTAIN	NOT NEEDED
Item 27	My peers supported me during this clinical rotation.			
Any additional comments:				
Workload in the clinical setting				
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – regarding workload in the clinical setting.		ESSENTIAL	UN-CERTAIN	NOT NEEDED
Item 28	I was treated like a student and not as a worker.			
Item 29	It was difficult to find help when needed.			
Item 30	I was overwhelmed with the amount of work to be done in the unit.			
Item 31	The workload in this unit is too heavy.			
Item 32	I was able to negotiate my workload.			
Any additional comments:				

Learning opportunities in the clinical setting				
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – learning opportunities in the clinical setting.		ESSENTIAL	UN-CERTAIN	NOT NEEDED
Item 33	I was excited about this clinical rotation.			
Item 34	I knew what was expected from me in this unit.			
Item 35	This unit offered multiple learning opportunities.			
Item 36	It was clear which of my clinical learning outcomes could be achieved in this unit.			
Item 37	I could achieve most of my clinical learning outcomes.			
Item 38	I was encouraged to optimise my learning opportunities.			
Item 39	Clinical meetings were a valuable learning opportunities.			
Item 40	Health science professionals directed me towards learning opportunities.			
Item 41	The health science professionals guided me in acquiring new skills.			
Item 42	I was allowed more independence as my skills increased.			
Item 43	I was allowed to work at my own pace.			
Item 44	We were competing with each other to practice clinical skills.			
Item 45	I became more confident during this rotation.			

In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – learning opportunities in the clinical setting.		ESSENTIAL	UN-CERTAIN	NOT NEEDED
Item 46	I received individual attention.			
Item 47	My supervisors were aware of my learning outcome needs.			
Item 48	Supervisors spent sufficient time with me.			
Item 49	My supervisors assisted me to link theory to practice.			
Item 50	Supervisors facilitated my reasoning regarding patient management.			
Item 51	Supervisors applied innovative learning activities.			
Item 52	The supervisors considered my emotional responses to the clinical experiences.			
Item 53	I am satisfied with the supervision I received.			
Item 54	Supervisors demonstrated expert patient management skills.			
Item 55	I was actively involved in managing patients.			
Item 56	I managed patients under supervision.			
Item 57	I was encouraged to ask questions regarding patient management.			
Item 58	I was theoretically prepared for this rotation.			
Item 59	There was a mismatch between what was taught in class and experiences during the clinical rotation.			

In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – learning opportunities in the clinical setting.		ESSENTIAL	UN-CERTAIN	NOT NEEDED
Item 60	I was evaluated on my clinical performance.			
Item 61	I received constructive feedback on my performance.			
Item 62	I continuously received constructive feedback on my performance.			
Item 63	I was encouraged to reflect on my clinical experiences.			
Item 64	My professional identity were developed			
Item 65	I am satisfied with my learning experience in this unit.			
Item 66	Health science professionals were good role models.			
Any additional comments:				

ADDENDUM C2

***Dichotomous instrument Round
2, with feedback from Round 3***

Dear Expert

Thank you for your willingness to participate in my research and the contribution that you made during round one of the Delphi process.

Attachment 1 is a summary of the findings of Round 1. A total of 22 (n=22) experts responded during Round 1.

There are **9 items** that were inconclusive and are highlighted in red. Please indicate if these items should be **included or excluded** from the Clinical learning environment instrument.

Please complete attached "CLE instrument Delphi final round". This questionnaire will take approximately 3 minutes of your time.

Send the completed questionnaire back to me by the 30th June 2020. This round will conclude the Delphi process.

Kind regards

Hanlie Jordaan

Participant nr _____ (for office use only)

Clinical learning environment instrument – Delphi final round

There are **nine items** that were inconclusive. Please indicate if these items should be **included or excluded** from the clinical learning environment instrument.

In your expert opinion, indicate which of the following items should be included or excluded from the instrument on the clinical learning environment (CLE)?		INCLUDED	EXCLUDED
Item 3	Facility / Equipment were well maintained.		
Item 13	Health science professionals considered innovative ideas regarding patient care.		
Item 15	Health science professionals demonstrated a person-centred care approach.		
Item 17	I experience bullying in this unit.		
Item 31	The workload in this unit is too heavy.		
Item 32	I was able to negotiate my workload.		
Item 33	I was excited about this clinical rotation.		
Item 43	I was allowed to work at my own pace.		
Item 59	There was a mismatch between what was taught in class and experiences during the clinical rotation.		

Read each statement and indicate with a X your chosen option			
Atmosphere and physical environment in the clinical setting			
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – regarding the atmosphere and physical environment in the clinical setting?		Essential	Uncertain Not needed
Item 1	I was welcomed to this unit.	77%	14% 9%
Item 2	I was orientated to the physical environment.	95%	5% 0%
Item 3	Facility / Equipment were well maintained.	64%	27% 9%
Item 4	Necessary resources were available to perform tasks well.	91%	5% 5%
Item 5	The unit was well organised.	91%	9% 0%
Item 6	Supervisors were approachable.	100%	0% 0%
Item 7	There was a reciprocal respectful relationship between the supervisors and myself.	100%	0% 0%
Item 8	There was unity between healthcare professionals in the unit.	77%	18% 5%
Item 9	There was a sense of trust among healthcare professionals.	82%	14% 5%
Item 10	Health science professionals had a positive attitude towards me.	91%	9% 0%
Item 11	I was able to build positive relationships with all the healthcare professionals.	91%	5% 5%
Item 12	I freely participated in discussions on patient management.	91%	9% 0%
Item 13	Health science professionals considered innovative ideas regarding patient care.	59%	27% 14%
Item 14	Health science professionals were professional in their actions.	95%	5% 0%
Item 15	Health science professionals demonstrated a person-centred care approach.	66%	23% 9%
Item 16	The unit is all about getting the job done.	32%	36% 32%
Item 17	I experience bullying in this unit.	59%	14% 27%
Item 18	I have a sense of work satisfaction after this clinical rotation.	82%	14% 5%

Clarification of item

Unmaintained facilities and/or equipment may interfere with students effectively engaging in teaching and learning activities.

Innovative ideas include different or other methods than normally used to rendering person centred care.

Person-centred care is health science professional's first priority.

Bullying are frequently experienced and reported by students in health science.

Teamwork in the clinical setting		Clarification of item		
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – regarding teamwork in the clinical setting.		Essential	Uncertain	Not needed
Item 19	Various health science professionals valued each other.	91%	9%	0%
Item 20	There was good communication among healthcare professionals.	100%	0%	0%
Item 21	There was shared decision making among the health science professionals.	82%	14%	5%
Item 22	I had a good working relationship with all the healthcare professionals.	82%	14%	5%
Item 23	I felt part of the health science professional team.	91%	5%	5%
Item 24	I was valued as a health science professional team member.	91%	9%	0%
Item 25	Health science professionals collaborated to support my learning.	91%	9%	0%
Item 26	Clinical facilitators shared their educational expertise with the team.	95%	5%	0%
Item 27	My peers supported me during this clinical rotation.	86%	14%	0%
Workload in the clinical setting		Clarification of item		
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – regarding workload in the clinical setting.		Essential	Uncertain	Not needed
Item 28	I was treated like a student and not as a worker.	73%	18%	9%
Item 29	It was difficult to find help when needed.	73%	14%	14%
Item 30	I was overwhelmed with the amount of work to be done in the unit.	73%	18%	9%
Item 31	The workload in this unit is too heavy.	41%	32%	27%
Item 32	I was able to negotiate my workload.	65%	23%	9%

The workload refers to the amount of work to be done by the student in a unit on a clinical day.

To negotiate workload refers to the opportunity students have to negotiate the amount of work to be done and still being able to achieve their outcomes.

Learning outcomes and opportunities in the clinical setting		Essential	Uncertain	Not needed	Clarification of item
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – learning outcomes and opportunities in the clinical setting.					
Item 33	I was excited about this clinical rotation.	55%	18%	23%	To determine the students initial attitude towards his/her clinical placement.
Item 34	I knew what was expected from me in this unit.	82%	14%	5%	
Item 35	This unit offered multiple learning opportunities.	95%	0%	5%	
Item 36	It was clear which of my clinical learning outcomes could be achieved in this unit.	86%	9%	5%	
Item 37	I could achieve most of my clinical learning outcomes.	82%	14%	5%	
Item 38	I was encouraged to optimise my learning opportunities.	95%	0%	5%	
Item 39	Clinical meetings were a valuable learning opportunities.	86%	5%	9%	
Item 40	Health science professionals directed me towards learning opportunities.	86%	9%	5%	
Item 41	The health science professionals guided me in acquiring new skills.	91%	9%	0%	
Item 42	I was allowed more independence as my skills increased.	100%	0%	0%	
Item 43	I was allowed to work at my own pace.	36%	41%	23%	To determine if the student was allowed to progress in his clinical learning at a pace set by the student
Item 44	We were competing with each other to practice clinical skills.	50%	14%	36%	
Item 45	I became more confident during this rotation.	82%	9%	9%	
Item 46	I received individual attention.	73%	18%	9%	
Item 47	My supervisors were aware of my learning outcome needs.	91%	0%	9%	
Item 48	Supervisors spent sufficient time with me.	82%	14%	5%	
Item 49	My supervisors assisted me to link theory to practice.	95%	0%	5%	
Item 50	Supervisors facilitated my reasoning regarding patient management.	95%	5%	0%	
Item 51	Supervisors applied innovative learning activities.	77%	18%	5%	
Item 52	The supervisors considered my emotional responses to the clinical experiences.	77%	18%	5%	

Learning outcomes and opportunities in the clinical setting		Clarification of item		
In your expert opinion, indicate which of the following items should be included in an instrument on the clinical learning environment (CLE) – learning outcomes and opportunities in the clinical setting.		Essential	Uncertain	Not needed
Item 53	I am satisfied with the supervision I received.	73%	23%	5%
Item 54	Supervisors demonstrated expert patient management skills.	91%	5%	5%
Item 55	I was actively involved in managing patients.	86%	14%	0%
Item 56	I managed patients under supervision.	91%	5%	5%
Item 57	I was encouraged to ask questions regarding patient management.	100%	0%	0%
Item 58	I was theoretically prepared for this rotation.	82%	14%	5%
Item 59	There was a mismatch between what was taught in class and experiences during the clinical rotation.	64%	18%	18%
Item 60	I was evaluated on my clinical performance.	91%	9%	0%
Item 61	I received constructive feedback on my clinical performance.	82%	5%	14%
Item 62	I continuously received constructive feedback on my performance.	86%	9%	5%
Item 63	I was encouraged to reflect on my clinical experiences.	100%	0%	0%
Item 64	My professional identity was developed	91%	9%	0%
Item 65	I am satisfied with my learning experience in this unit.	91%	5%	5%
Item 66	Health science professionals were good role models.	82%	14%	5%

Students experience a difference in what was taught in class (theory/practice) in comparison to what is being done in clinical practice.

ADDENDUM C3

***Dichotomous instrument Round
3, with feedback from Round 2***

Dear Expert

Thank you for your willingness to participate in my research and for your contribution during round two of the Delphi study. The detailed feedback of the previous rounds will be incorporated into the refined instrument after the completion of the final round. Unfortunately, could we not conclude the study on the previous rounds.

Attachment 1 is a summary of the findings of Round 2. A total of 16 (n=16) experts responded during Round 2. Five items are still considered as inconclusive.

Please complete the attached “CLE instrument Delphi round 3” by indicating if the five items should be **included** or **excluded** from the questionnaire. This questionnaire will take approximately 2 minutes of your time.

Send the completed questionnaire back to me by the 31st of July 2020.

Kind regards

Hanlie Jordaan

Participant nr _____ (for office use only)

Clinical learning environment instrument – Delphi final round

There are **five items** that were inconclusive. Please indicate if these items should be **included or excluded** from the clinical learning environment instrument.

In your expert opinion, indicate which of the following items should be included or excluded from the instrument on the clinical learning environment (CLE)?		INCLUDED	EXCLUDED	Clarification of item
Item 17	I experience bullying in this unit.			Bullying are frequently experienced and reported by students in health science.
Item 31	The workload in this unit is too heavy.			The workload refers to the amount of work to be done by the <u>student</u> in a unit on a clinical day.
Item 32	I was able to negotiate my workload.			To negotiate workload refers to the opportunity students have in the unit to negotiate the amount of work to be done on a clinical day and still being able to achieve their outcomes.
Item 33	I was excited about this clinical rotation.			To determine the students initial attitude towards his/her clinical placement.
Item 43	I was allowed to work at my own pace.			To determine if the student was allowed to progress in his clinical learning at a comfortable pace set by the student

Summary of previous round		INCLUDED	EXCLUDED
Item 17	I experience bullying in this unit.	39%	31%
Item 31	The workload in this unit is too heavy.	56%	44%
Item 32	I was able to negotiate my workload.	63%	38%
Item 33	I was excited about this clinical rotation.	69%	31%
Item 43	I was allowed to work at my own pace.	63%	38%

ADDENDUM D

Matrix of Delphi panel members

Matrix of Criteria for Delphi panel

Participant	Name	Job description	Health Science Bachelors or higher degree	Years professional clinical experience (min 5 years)	Clinical accompaniment or supervision of students in the CLE	Willing to participate in all rounds	Email addresses
Biokineticist	Confidential information of participants						Confidential information of participants
Participant 1		Lecturer, Faculty of Health Sciences, Free State, South Africa.	x	x	x	x	
Participant 2		Lecturer, Exercise and sport sciences, Free State, South Africa	x	x	x	x	
Participant 3		Lecturer, North West, South Africa	x	x	x	x	
Dentist							
Participant 4		Senior lecturer, Department of Oral Maxillofacial Surgery and oral pathology, Nigeria	x	x	x	x	
Participant 5		Associated Professor at the Department of Dental Management Sciences, Tshwane, South Africa	x	x	x	x	

Participant	Name	Job description	Health Science Bachelors or higher degree	Years professional clinical experience (min 5 years)	Clinical accompaniment or supervision of students in the CLE	Willing to participate in all rounds	Email addresses
Participant 6	Confidential information of participants	Lecturer, Western Cape, South Africa	x	x	x	x	Confidential information of participants
Dietitian							
Participant 7		Lecturer, Lesotho	x	x	x	x	
Participant 8		Junior lecturer, Free state, South Africa	x	x	x	x	
Participant 9		Lecturer, North West, South Africa	x	x	x	x	
Nursing							
Participant 10		Nurse Educator, Western Cape, South Africa	x	x	x	x	
Participant 11		Lecturer, Department of Science and technology, Uganda	x	x	x	x	
Participant 12		Head of department academic student affairs, Mpumalanga, South Africa	x	x	x	x	
Participant 13		Lecturer, Free state, South Africa	x	x	x	x	
Participant 14		Lecturer, Western Cape, South Africa	x	x	x	x	

Participant	Name	Job description	Health Science Bachelors or higher degree	Years professional clinical experience (min 5 years)	Clinical accompaniment or supervision of students in the CLE	Willing to participate in all rounds	Email addresses
Occupational therapist							
Participant 15		Lecturer, Tshwane region, South Africa	x	x	x	x	
Participant 16		Lecturer, Free State, South Africa	x	x	x	x	
Participant 17		Lecturer, Nigeria	x	x	x	x	
Participant 18		Lecturer, Gauteng, South Africa	x	x	x	x	
Paramedic							
Participant 19	Confidential information of participants	Training manager, Western Cape, South Africa	x	x	x	x	Confidential information of participants
Participant 20		Principal: Emergency Care, Free State, South Africa	x	x	x	x	
Participant 21		Lecturer, Eastern Cape, South Africa	x	x	x	x	
Optometrist							
Participant 22		Senior tutor, Kwa-Zulu Natal, South Africa	x	x	x	x	

Participant	Name	Job description	Health Science Bachelors or higher degree	Years professional clinical experience (min 5 years)	Clinical accompaniment or supervision of students in the CLE	Willing to participate in all rounds	Email addresses
Physio- therapist							
Participant 23		Lecturer, Rwanda	x	x	x	x	
Participant 24		Lecturer & Clinical coordinator, Gauteng, South Africa	x	x	x	x	
Participant 25		Lecturer, clinical supervisor and clinical coordinator, Western Cape, South Africa	x	x	x	x	
Participant 26		Lecturer, clinical supervisor, Tshwane, South Africa	x	x	x	x	
Medical physician							
Participant 27		Senior lecturer, Free State, South Africa	x	x	x	x	
Participant 28		Lecturer, Uganda	x	x	x	x	
Participant 29		Affiliated lecture, Free State, South Africa	x	x	x	x	
Participant 30		Service learning coordinator/ senior lecturer, Tshwane, South Africa	x	x	x	x	

Participant	Name	Job description	Health Science Bachelors or higher degree	Years professional clinical experience (min 5 years)	Clinical accompaniment or supervision of students in the CLE	Willing to participate in all rounds	Email addresses
Participant 31		Clinical preceptor in Health Professions education, Obstetrician, Uganda	x	x	x	x	
Pharmacist	Confidential information of participants						Confidential information of participants
Participant 32		Clinical preceptor, North West, South Africa	x	x	x	x	
Participant 33		Clinical pharmacist, North West, South Africa	x	x	x	x	
Participant 34		Senior lecturer, North West, South Africa	x	x	x	x	
Radiographer							
Participant 35		Lecturer at department of clinical science, Free State, South Africa	x	x	x	x	
Participant 36		Lecturer, Tshwane, South Africa	x	x	x	x	

ADDENDUM E

Version 2 instrument

Participant nr _____

By completing this questionnaire, you are consenting to participate in the research. Please evaluate the clinical learning environment where you were placed during this month. Your participation is voluntary and anonymous.

Biographic data						
Indicate your profession by ticking of the following:	Biokinetics	Dentistry	Dietician / Nutritionist			
	Nursing	Occupational therapy	Optometry			
	Paramedic	Physiotherapist	Medical physician			
	Pharmacy	Radiography				
	Other:					
Indicate your year of study by ticking the following:	First year	Second year	Third year	Fourth year	Fifth year	Post graduate
Indicate your age						
Indicate your ethnicity by ticking the following:	Asian	Black	Coloured	White		
	Other:					
Indicate your gender by ticking the following:	Female			Male		

Read each statement and indicate your chosen option with an “X”					
Atmosphere in the clinical setting					
		Strongly agree	Agree	Disagree	Strongly disagree
Item 1	I was welcomed to this unit.				
Item 2	I was orientated to the physical environment.				
Item 3	Facility / Equipment was well maintained.				
Item 4	Necessary resources were available to perform tasks well.				
Item 5	The unit was well organised.				
Item 6	My supervisors were approachable.				
Item 7	There was a mutually respectful relationship between the supervisors and myself.				
Item 8	There was unity between the healthcare professionals in the unit.				
Item 9	There was a sense of trust among the healthcare professionals.				
Item 10	Healthcare professionals exhibited a positive attitude towards me.				
Item 11	I was able to build positive relationships with all the healthcare professionals.				
Item 12	I freely participated in discussions on patient management.				

		Strongly agree	Agree	Disagree	Strongly disagree
Item 13	The healthcare professionals would consider innovative ideas ¹ regarding patient care.				
Item 14	The healthcare professionals were professional in their actions.				
Item 15	The healthcare professionals demonstrated a person-centred care approach.				
Item 16	I experienced bullying ² in this unit.				
Item 17	I have a sense of work satisfaction after this clinical rotation.				

¹ variety of interesting patient cases

² negative, unwanted acts aimed at other people

Teamwork in the clinical setting					
		Strongly agree	Agree	Disagree	Strongly disagree
Item 18	Various healthcare professionals demonstrated that they valued each other.				
Item 19	There was good communication among healthcare professionals.				
Item 20	There was shared decision-making among the healthcare professionals.				
Item 21	I had a good working relationship with all the healthcare professionals.				
Item 22	I felt part of the healthcare professional team.				
Item 23	I was valued as a healthcare professional team member.				
Item 24	The healthcare professionals collaborated to support my learning.				
Item 25	The clinical facilitators shared their educational expertise with the team.				
Item 26	My student peer supported me during this clinical rotation.				

Workload in the clinical setting					
		Strongly agree	Agree	Disagree	Strongly disagree
Item 27	I was treated like a student and not as a worker.				
Item 28	It was difficult to find help when I needed it.				
Item 29	I was overwhelmed with the amount of work to be done in the unit.				
Item 30	I was able to negotiate my workload.				

Learning opportunities in the clinical setting					
		Strongly agree	Agree	Disagree	Strongly disagree
Item 31	I was excited about this clinical rotation.				
Item 32	I knew what was expected from me in this unit.				
Item 33	This unit offered multiple learning opportunities ³ .				
Item 34	It was clear which of my clinical learning outcomes could be achieved in this unit.				
Item 35	I could achieve most of my clinical learning outcomes in this unit.				
Item 36	I was encouraged to improve my learning opportunities.				
Item 37	Clinical meetings were a valuable learning opportunity in the unit.				
Item 38	The healthcare professionals directed me towards learning opportunities.				
Item 39	The healthcare professionals guided me in acquiring new skills.				
Item 40	I was allowed more independence as my skills increased.				
Item 41	I became more confident during this rotation.				
Item 42	I received individual attention from my supervisors.				
Item 43	My supervisors were aware of my learning outcome needs.				

³ potential learning occasions

		Strongly agree	Agree	Disagree	Strongly disagree
Item 44	My supervisors spent sufficient time with me.				
Item 45	My supervisors assisted me to link theory to practice.				
Item 46	My supervisors facilitated my reasoning regarding patient management.				
Item 47	My supervisors applied innovative learning activities.				
Item 48	The supervisors considered my emotional responses to the clinical experiences.				
Item 49	I am satisfied with the supervision I received.				
Item 50	My supervisors demonstrated expert patient management skills.				
Item 51	I was actively involved in managing patients.				
Item 52	I managed patients under supervision.				
Item 53	I was encouraged to ask questions regarding patient management.				
Item 54	I was academically prepared for this rotation.				
Item 55	There was a mismatch between what was taught in class and my experiences during the clinical rotation.				
Item 56	I was evaluated on my clinical performance.				
Item 57	I received constructive feedback on my performance.				

		Strongly agree	Agree	Disagree	Strongly disagree
Item 58	I continuously received constructive feedback on my clinical performance.				
Item 59	I was encouraged to reflect on my clinical experiences.				
Item 60	My professional identity as a healthcare professional was developed				
Item 61	I am satisfied with my learning experiences in this unit.				
Item 62	The healthcare professionals were good role models.				