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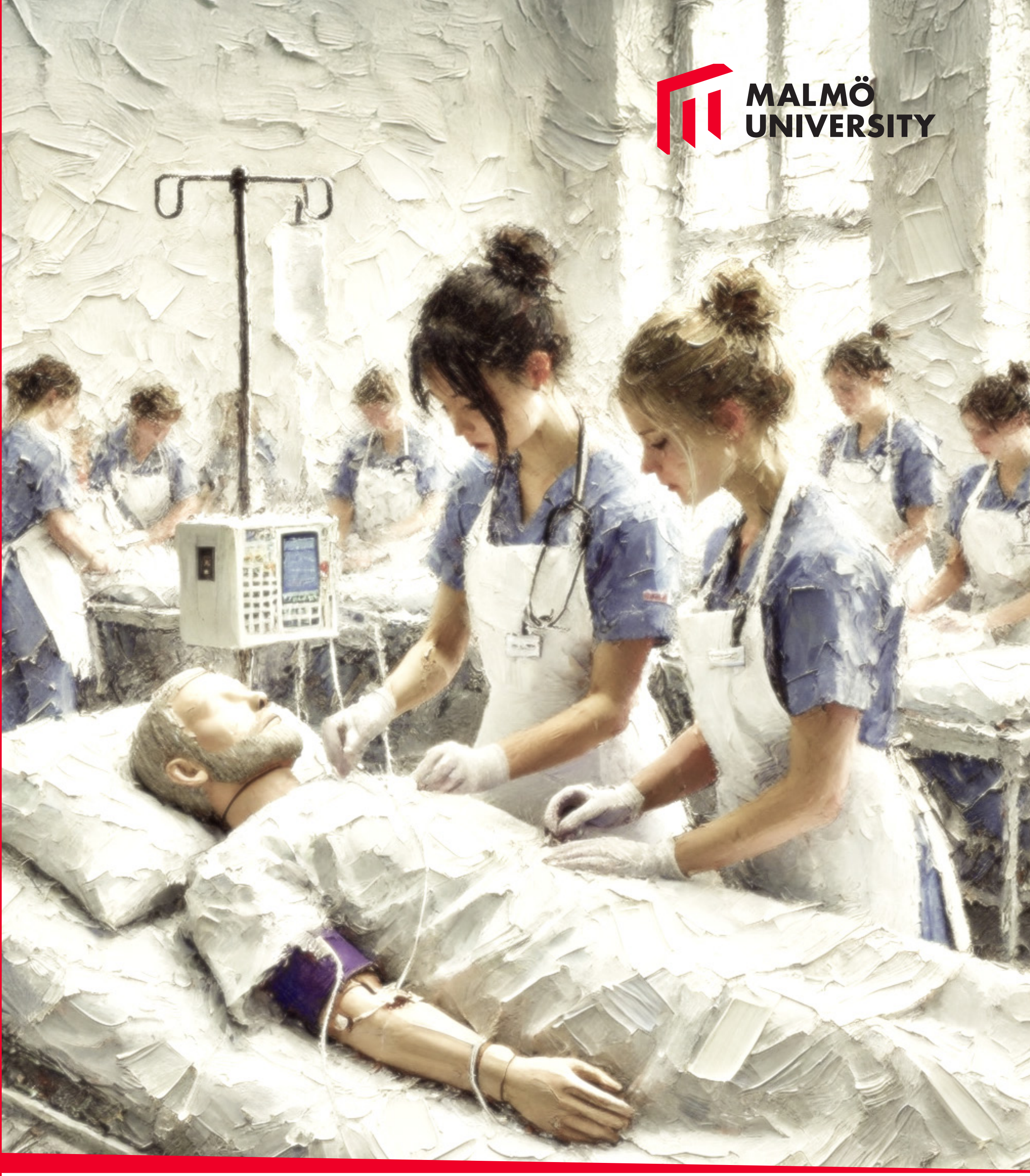

Marie Stenberg

Collaboration in Clinical Skills Lab

Perspectives from students and educators in nurse education

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COLLABORATION IN CLINICAL SKILLS LAB

- Perspectives from students and educators in nurse education

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Thesis for Doctoral Degree (Ph.D.)
By Marie Stenberg

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Perspectives from students and educators in nurse education

Malmö University
Faculty of Health and Society
Malmö University Press, 2025

TABLE OF CONTENTS

ABSTRACT

The overall aim of this thesis was to explore the collaboration and the collaborative process between bachelor nursing students during clinical skills lab practices from the perspective of nursing students and nurse educators and the use of formative peer assessment in higher healthcare education programs.

In the first study, an exploration of formative peer assessment in higher healthcare education programs was carried out by mapping the existing research literature in the field. After critical appraisal of the literature, a thematic analysis was performed. The results revealed a process consisting of two consecutive phases. The first phase involved the rationale for formative peer assessment, which was to support student learning as preparation for the healthcare professions. The second phase concerned the organization and the structure of the formative peer assessment activity and how the complexity of collaboration between the students affected their relationships with each other. The revealed complexity of peer collaboration influenced the aim of the subsequent empirical qualitative studies because similar results have been described in previous studies in connection with collaborative learning activities.

The second and third studies explored how first-year bachelor nursing students collaborate as well as the collaborative process during practice in clinical skills labs. Fieldwork with participant observations and focus group interviews was performed. Thematic network analysis was carried out in the second study, and a narrative analysis of fieldnotes and transcribed focus groups interviews was conducted in the third study to analyse the collaborative process. In the fourth study, interviews were performed with nurse educators with teaching experiences from clinical skills labs. The aim was to understand their different conceptions of nursing students' collaboration. The transcribed interviews were analysed with a phenomenographic approach.

The findings from the second study showed that collaboration between nursing students is a field of tension between adaptation and non-conformity. Adaptation represents the students' ability to adapt to new knowledge, to each other, and to

being a nursing student. The non-conformity in the collaboration corresponds to students' difficulties in accepting the perspective of others, finding mutual goals, sharing decisions, and providing supportive and constructive feedback to each other.

In the third study a sequential process was identified in the exploration of the collaborative process between the nursing students. The initial period was characterized by navigating in unfamiliar territory, which included anxieties related to not being involved, not being familiar with the context, and not being sure of the expectations. Over time, the students started to navigate together to cope in response to the complexities of the tasks they had ahead of them. To overcome these complexities, they looked for people like themselves, which led to homogenous groups. At the end of their training period the students were approaching independence in anticipation of their future nursing profession. In this period the role of the educator became less prominent, and the students mostly relied on each other's knowledge. The feedback they provided to each other became constructive with suggestions for improvement. The focus was now on the task at hand, and with whom it was practiced was of less importance.

In the final study, the nurse educators' various conceptions of nursing students' collaboration described an outcome space that indicated that the purpose of collaboration was the most complex descriptive category that formed the didactive activities related to collaboration, the nursing students' interpersonal skills, and the group activity skills.

Conclusively, and reflected in Vygotsky's theory of Zone of Proximal Development, the collaboration between the nursing students during skills lab practices shows that the students' collaboration can develop from a zone of current development to a collective zone of proximal development with support from their peers. For education to support the students' transition to independence, the educational purpose of collaboration needs to be defined by the faculty. The collaboration needs to be guided by scaffolding activities contextualized to the nursing profession and adjusted to where the students are in the collaborative process. Instructional directives for peer observations and feedback along with didactive activities might decrease anxiety and complexity in collaborative learning and thereby prepare students for the crucial collaboration that takes place in the nursing profession.

LIST OF PUBLICATIONS

I) Formative peer assessment in higher healthcare education programmes: a scoping review. *BMJ Open*. 2021 Jan12.

II) Collaboration between first year undergraduate nursing students. - A focused ethnographic study. *Nurse Education in Practice.* 2022 Aug 3.

III) Supporting each other towards independence: A narrative analysis of first-year nursing students' collaborative process. *Nursing Inquiry*. 2024 Feb 1.

IV) The phenomenographic outcome space of nurse educators' conception of nursing students' collaboration in clinical skills lab. Submitted to *Nurse Education Today.* 2025 Jan 13.

Additional paper

Formative peer assessment in healthcare education programmes: protocol for a scoping review. *BMJ Open*. 2018 Oct 8.

ABBREVATIONS

CL	Collaborative Learning
CLIP	Collaborative Learning in Practice
FPA	Formative Peer Assessment
ZCD	Zone of Current Development
ZPD	Zone of Proximal Development

PREFACE

My interest in collaborative learning in nurse education started as a clinical lecturer at Malmö University. Together with colleagues, preceptors, and clinical teachers, we started to implement a collaborative educational model in clinical practice at the university hospital in Malmö in the early 2010s. At the time this was a pragmatic solution to meet the requirement of the Swedish government to educate more nurses and to accomplish this in a clinical environment that was marked with financial cuts and with a shortage of nurses and nurse preceptors. From that starting point I have come to develop my understanding of collaborative learning as more than just a pragmatic solution for clinical practice and the need for implementation of the pedagogy in campus-based education.

My earlier experiences from the clinical setting and previous research (Carlson & Stenberg, 2020; Carlson et al., 2017; Carlson et al., 2019; Stenberg et al., 2020; 2015) have shown me that that collaborative learning is a sound model for student learning in both theoretical and clinical courses in nurse education. However, the experience has also taught me that collaboration can be complex and a challenge for both students and educators and that there is a need to develop collaboration and the quality of feedback provided between students. This is important because collaborative skills are required in the profession. This thesis seeks to contribute valuable implications for collaboration and the development of collaborative learning in future nursing education and for preparing nursing students for engaging in collaboration in their future profession.

INTRODUCTION

If we teach today's students as we taught yesterday's, we rob them of tomorrow (John Dewey, 1916)

The quote by John Dewey is old but is still relevant to the development of today's pedagogy and concerns the needs to build the foundation of an evidence-based pedagogy for teaching and learning in higher education (Herodotou et al., 2019). For nurse education, this mean identifying pedagogies that can close the gap between academic learning and required knowledge and skills in the nursing profession (Webera et al., 2021). One such identified gap concerns the ability to collaborate. The reason for this is seen in a previous studies showing how non-functional collaboration between healthcare professionals affects patient safety and patient care satisfaction and results in medical mistakes and increased risk of patient mortality (Morley & Cashell, 2017; Wei et al., 2022). This highlights the importance for healthcare education programs to implement pedagogies in the curriculum that involve collaborative activities that can prepare students for the collaborative requirements in the profession and thus ensure patient safety.

The concepts in this thesis are related to nurse education, and the basis of its explorations are found in the educational models of collaborative learning (CL). CL represents a shift from the universities' traditional individualistic approach to teaching and learning to acknowledging the collaborative attributes that are important for supporting students' learning development (Boud & Bearman, 2022). In CL, students are expected to be active partners, referred to as peers, who teach and learn from and with each other (Boud et al., 2014). The activity between the students in CL includes a formative peer assessment (FPA) approach, meaning that the students reflect on the performance and contribution of their peers and provide feedback to each other (Boud & Bearman, 2022; Boud & Soler, 2016).

The interactions between the students in CL have been shown to support the development of learning and social skills, but they have also been described as challenging and complex (Zhang & Cui, 2018). Freeriding, bullying, and negative competition between students are some examples of the consequences of challenging collaboration that affect both educators and students (Aase et al., 2016; Stenberg & Carlson, 2015; Zhang & Cui, 2018). However, there are few studies that have presented solutions to overcoming the collaborative challenges in CL. To develop an evidence-based pedagogy in nurse education, collaboration needs to be explored and understood in the context of nursing students. Furthermore, educational interventions need to be underpinned with established theoretical grounds that have been proven effective for learning (Herodotou et al., 2019). Therefore, this thesis takes a theoretical position in socio-cultural learning and in the development theory of Lev Vygotsky (1980) when reflecting on the results of the included studies.

BACKGROUND

This thesis is built on concepts related to the educational model of CL and includes the concept of collaboration in nurse education and FPA in higher healthcare education programs. The concepts and the theoretical framework of the thesis are presented and explained in the following section.

Collaboration

Collaboration is a well-known word and concept in most people's daily life. The word derives from the Latin word "collaborare", meaning "working together" (Camarihna-Matos & Afsarmanesh, 2008), and implies an interaction between two or more people creating knowledge by working together towards common goals (Patel et al., 2012). Collaboration can be understood as a phenomenon and a as a process (Goulet et al., 2003). As a phenomenon, the interaction is characterized by a synchronized activity in order to mutually solve a problem (Roschelle & Teasley, 1995), and this is represented by each participant having access to the same action, being at roughly the same knowledge level, and having a goal that is common to all involved in the interaction (Dillenbourg, 1999). The interaction involves negotiations, discussions, and a willingness to encounter others' perspectives (Dillenbourg & Baker, 1996).

Closely related concepts to collaboration are teamwork and cooperation, but with differences in their meaning (Baker, 2015). Teamwork is foremost associated with professionals contributing with individual expertise and shared decision making (Xyrichis & Ream, 2008). Cooperation implies a division of labour with individual and separate contributions to a common goal (Goulet et al., 2003; Kirschner, 2001). In contrast to teamwork and cooperation, collaboration involves working together interdependently with mutual engagement and shared contribution to the final product (Child & Shaw, 2016; Kirschner, 2001). The interdependency relates to the fact that the goal can only be reached if every member of the group contributes (Care et al., 2016).

Collaborative skills are commonly mentioned as being necessary for successfully working in the 21st century (Child & Shaw, 2016; Evans, 2020). The collaborative skills that are described include being able to plan with the group and through discussions and negotiation find mutual understandings of how to complete a task and agree upon the division of roles (Evans, 2020). Communicative skills are central for expressing and reflecting one's own thoughts and perspective as well as getting an impression of what others are thinking (Evans, 2020), which helps people come to mutual understandings (Goulet et al., 2003). Collaborative skills further prompt the contribution and support of the group and include the ability and willingness to provide feedback on the work of others (Boud, 2015; Cavallo, 2024), and an openness to receive feedback (Goulet et al., 2003).

Collaboration as a process implies a transformation in the participants (Goulet et al., 2003). Respect for everyone's voice to be heard, listening and an openness to others are described as vital in the process. By sharing experiences with others, one's own experience will change and lead to an increased awareness of others which will be supportive for learning and in future collaborations. Conflict will be a part of the process and cannot be avoided but needs to be handled constructively (Goulet et al., 2003).

Collaboration between students in higher education

Collaboration between students in higher education is in this thesis represented in CL. CL has been developed and has influenced higher education in recent decades (Baker, 2015; Gjevjon et al., 2021) and is an umbrella term for several educational models in higher education, including peer learning (Boud et al., 2014), problem-based learning (Wood, 2003), peer tutoring, peer mentoring (Topping, 1996), and peer-assisted learning (Topping et al., 2009).

These models stand in contrast to traditional pedagogy in higher education where students are expected to be passive receivers of information from educators (Dillenbourg, 1999). Instead, these models represent different approaches to learning but with the commonality of acknowledging student activity and knowledge as being constructed in collaboration between students (Dillenbourg, 1999). The students are referred to as peers, and the concept involves two students or small groups of students working jointly with each other (Boud et al., 2014). Peers can be represented by students from the same or from different levels of education, or by students from different educational settings such as in interprofessional learning (Boud et al., 2014). This thesis examines students from the same educational program and level.

In CL, students solve problems together, teach each other, and reflect with one another (Boud et al., 2014), and in these interactions everyone is responsible for their own actions, for their contribution to the learning, and for respecting the contributions of their peers (Patel et al., 2012).

Learning is central in CL and can be described as either informal, non-formal, or formal (Laal, 2012). Informal learning is associated with daily living activities and the learning that arises out of such experiences (Laal, 2012). In this thesis learning is defined as formal, implying that learning is educationally organized, structured, and leads to a diploma. Furthermore, it can be non-formal, indicating that learning consists of specific activities that are not designed specifically as learning but consist of learning associated with professional work (Laal, 2012). This is in line with the notion of life-long learning. Providing students in higher education with the opportunity to learn from and with each other has been shown to develop life-long learning skills such as enhanced critical thinking, collaborative and communication skills, independence, and self-confidence (Boud et al., 2014). Lifelong learning refers to skills required in a life perspective and is represented by an active process of a self-directed search for knowledge and understanding (Nayda & Rankin, 2008). Lifelong learning in CL is associated with the ability to collaborate, the ability to communicate knowledge and understanding to others, the ability to master skills, the ability to take a critical approach and attitude, and the ability to reflect and assess not only oneself, but also others (Boud et al., 2014).

In CL, the role of the educator is described as important even though the activity lies in the interactions between the students (Coetzee et al., 2018; Van Leeuwen & Janssen, 2019). It includes planning and setting up the conditions for collaboration (Evans, 2020; Nielson et al., 2019). For positive interdependence, the learning outcomes need to be defined, and the composition of collaborative tasks, feedback, and activities needs to be settled (Evans, 2020; Kaendler et al., 2015; Nielson et al., 2019). Educators also need to take responsibility for group composition and for deciding whether groups should be heterogenous or homogenous (Kaendler et al., 2015). The educator is expected to be a role model in the interactions and to monitor the collaboration so that they can intervene if the interaction is not working (Kaendler et al., 2015).

Collaboration in nurse education

The nurse education field has acknowledged CL as a key concept of life-long learning (Qalehsari et al., 2017). Besides supporting student learning, CL has been presented as an educational model that can meet the collaborative requirements in the nursing profession (Gjevjon et al., 2021). Nursing is in its essence collaborative. It involves multiple collaborations with colleagues, patients, next of kin, and students and therefore needs to be addressed in nurse education (Qalehsari et al., 2017). The importance of collaboration in the nursing profession has foremost been associated with being a member of a team and with the interprofessional characteristics of the daily work in healthcare (Emich, 2018). Not least have different goals and expectations within a team been shown to generate collaborative conflicts with consequences that are closely associated with safe patient care (Morley & Cashell, 2017; Reeves et al., 2017). Having CL activities embedded in the curriculum in nurse education programs can prepare undergraduate nursing students for the crucial collaborative requirements they will face in the healthcare profession (Morley & Cashell, 2017).

In nurse education, collaboration has foremost focused on supporting the students' learning processes (Mamhidir et al., 2014) motivated by the desire to support current and future generations of students (Gunnarsdottir et al., 2021). CL in nurse education has been reported to contribute to both the personal and professional development of undergraduate nursing students (Abdullah & Chan, 2018; Markowski et al., 2021), and it is described as enhancing communication and social skills (Baghcheghi et al., 2011), self-efficacy (Pålsson et al., 2021), self-confidence (Ruth-Sahd, 2011), and independence (Markowski et al., 2021) and supporting self-confidence, collaboration, and leadership abilities (Stenberg & Carlson, 2015; Zhang & Cui, 2018).

Clinical practice is an important part of nurse education, and several studies have presented CL in this part of education by referring to peer learning, the 2:1 model, or the CLIP-model (Collaborative Learning in Practice). The models refer to two students supporting each other and being supervised by a dedicated preceptor. The results reveal that preceptors are in general positive and present advantages such as allowing them to take a less prominent role because the students mainly support each other (Holst et al., 2017; Nygren & Carlson, 2017). Additionally, preceptors experience CL as a preparation for the collaborative expectations within the nursing profession (Holst et al., 2017; Ruth-Sahd, 2011), and it has been shown that instructional directives help to organize students' collaboration and increase their reflection on nursing practice (Coffman et al., 2023; Stenberg et al., 2020).

However, even though CL describes situations where interactions among students are anticipated to occur, there are no guarantees that this will be the case (Dillenbourg, 1999; Goulet et al., 2003). Challenges reported in nurse education describe students' unwillingness to collaborate because of freeriding, meaning that some students do not contribute in the collaboration and instead let others do all the work (Stover & Holland, 2018). Furthermore, there have been reports of a lack of collaborative skills (Le et al., 2018); hierarchical structures, disrespect, and confrontations (Aase et al., 2014); incompatible students or competitive relationships between students (Nygren & Carlson, 2017; Stenberg & Carlson, 2015); and challenges such as bullying, rudeness, and non-supportive behaviour between students, which have been shown to lead to a risk of early exit from education (Cavallo, 2024).

Formative peer assessment

As guidance for collaboration, different activities can be applied. In CL the involvement of formative peer assessment (FPA) has been described as central because it involves the key characteristic of feedback, communication, and collaboration between peers (Boud et al., 2014). However, when organizing collaboration there is a need to decide whether collaboration is perceived as a process or an outcome, and distinguishing between the two is important when it comes to the assessment of collaboration (Boud & Bearman, 2022). If collaboration is perceived as a process, it is the quality of students' interaction that is at the front, instead of collaboration as an outcome when it concerns the end product of students' ability to collaborate (Boud & Bearman, 2022). Assessment in education is a type of feedback and can be performed as either summative or formative feedback. Summative assessment is traditionally associated with educators making judgements and grading *of* student learning (Black & Wiliam, 1998; O'Neill et al., 2020). The judgements are made at the end of a learning process and represent feedback regarding a single student's performance (Boud & Bearman, 2022; O'Neill et al., 2020) even if the process has been collaborative (Boud & Bearman, 2022). Formative assessment is an approach to assessment *for* learning and focuses on the development of the student's learning process (O'Neill et al., 2020; Sadler, 2010). The aim of formative assessment is to improve learning during the learning process (Topping, 1998) and feedback is central and is often equated with formative assessment (Sadler, 2010). When the feedback is performed between students it is referred to as FPA.

FPA is positioned as an important educational approach and a significant part of student's collaboration and collaborative learning because of the involvement of reflection and feedback (Boud & Bearman, 2022; Lerchenfeldt et al., 2019). By practicing reflection and feedback during their education, the students are prepared for the interactions they will meet in their future professions (Boud & Bearman, 2022; Lerchenfeldt et al., 2019). FPA involves students taking responsibility for assessing the work of their peers against specific criteria (Boud et al., 2014) and is defined as

> 'an arrangement in which individuals consider the amount, level, quality, or success of the products or outcomes of learning of peers of similar status' (Topping, 1998,p.250).

FPA has been shown to result in improved understanding of the assessment criteria, greater insight into the students’ own approaches to an assessment task in comparison to their peers, and the development of judgement skills, analytical abilities, and self-awareness (Boud et al., 2014). Further, peer assessment can be used to address course goals such as those related to learning development and professional teamwork, and broader goals for social skills and life-long learning (Boud et al., 2014). In this thesis collaboration is considered a process focusing on the formative approach to assessment and thus involves students’ reflection of their performance, peer observations, and peer feedback as central in the learning process.

THEORETICAL FRAMEWORK

The theoretical framework of this thesis is positioned within the ontological paradigm of socio-constructivism. Constructivism explains how humans learn and focuses on human learning as being constructed. This means that knowledge is built on the foundation of a person's previous learning and experiences and that learning is active rather than passive (Tam, 2000). In socio-constructivism, a learning situation implies students taking an active role as constructors of new knowledge in social interactions and collaboration instead of being understood as something that can be transferred from one person to another (Bada & Olusegun, 2015). The philosophical assumptions in socio-constructivism have developed theories for learning and CL that are referred to and are associated with socio-cultural learning theory (Wang, 2007).

Socio-cultural learning theory

The standpoint in this thesis is taken in socio-cultural learning theory as presented by Lev Vygotsky. Vygotsky's development of socio-cultural theory has influenced the advancement of CL since the 1960s (John-Steiner & Mahn, 1996). Vygotsky (1980) states that learning first takes place in interaction with others on a social level (intermental) before it becomes internalized on an individual level (intramental). Assessment is seen as a cultural activity in a specific cultural context where students and educators bring their experiences and norms into the assessment (Elwood, 2006). In socio-cultural learning, progression is not to be understood as a linear step-by-step process, but instead it can be understood as going forward, backward, up, and down within a zone rather than on a line (James & Lewis, 2012). This development process is presented by Vygotsky (1980) as a person's zone of proximal development (ZPD).

The Zone of proximal development

The ZPD means that when a student faces a new task to perform the student starts from a given position of knowledge expressed as the zone of current development

(ZCD) (Vygotsky, 1980). Initially the student can perform the task only with assistance from more capable others, for instance a peer, a teacher, or a preceptor. In time, the student becomes more skilful and needs less assistance until the student can perform the task independently without any assistance in the student's ZPD (figure 1). Vygotsky discussed this relationship between the individual and the social context as a transformation of development of the socially shared activities into internalized processes. In the ZPD, learning and development are encapsulated, and competence is preceded by performance, which develops through participation in social practices. This development process is further mediated by language and other symbols, or artefacts, forming the learning. The role of the peer, teacher, or preceptor in the development process is seen as scaffolding, thus facilitating the student's development (Wood et al., 1976).

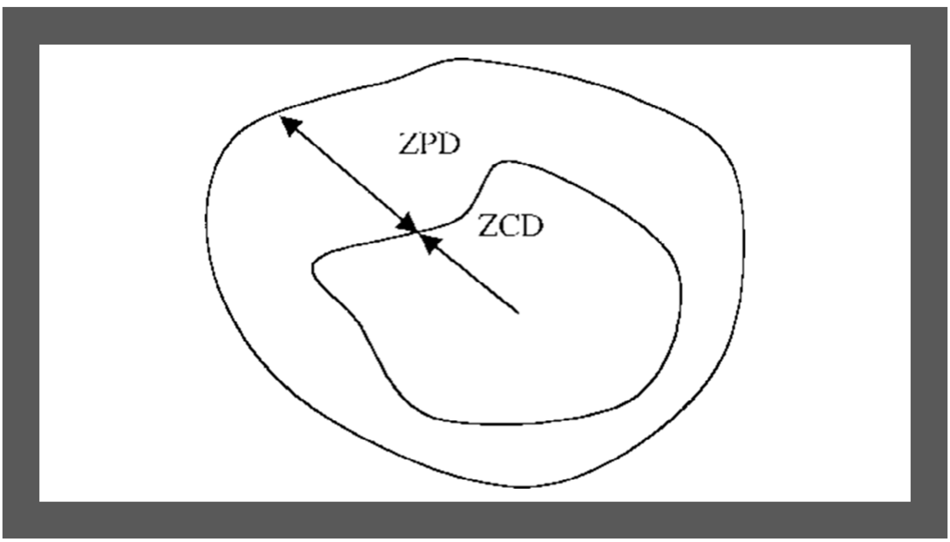

Figure 1. The Zone of Proximal Development (Vygotsky, 1980)

Scaffolding

Scaffolding acts as a mediator in knowledge development and is a metaphor for the support surrounding the student (Wood et al., 1976). The concept was first mentioned by Bruner and colleagues but derives from Vygotsky's sociocultural theory and the ZPD (Wood et al., 1976). The metaphor comes from the supporting constructions that are used when building houses. In education, scaffolding represents the support that is expected to be given by the educator to the individual student so that the student can develop from their current level of knowledge to their proximal level of knowledge (Van de Pol et al., 2019). In the interaction between the educator and the student, scaffolding is characterized as adaptive or contingent, fading, and transfer of responsibility (Van de Pol et al., 2010). Adaptive or contingent means that the support a student needs must first be identified and there must be a preparation for the support to be given. This involves the individual identification and adaptation of every student's needs for scaffolding. By the time the student has developed, the support from the educator is fading. The fading continues until the responsibility is transferred from the educator to the student and the student can manage by themselves (Van de Pol et al., 2010).

Other mediators that are important for knowledge development include language and artefacts. Language acts as a mediator and was identified by Vygotsky when studying how speech develops in small children (Vygotsky, 2012). Vygotsky found that the development of speech adheres to the collective understanding of a language and is connected to a specific cultural context. He explains how language is gradually internalized and how it develops from daily speech to scientific meaning. In the same way, artefacts are referred to by Vygotsky as symbols and things associated with a specific context and that mediate development (2012). In nursing this could, for example, be a measure for blood pressure, a patient journal, a syringe, or a bladder scanner.

RATIONALE

Collaboration is a crucial skill in healthcare professions, and non-functional collaboration has been shown to cause errors with negative consequences for patient safety. Thus, it has been argued that the practice of collaboration and development of collaborative skills must be a vital part of nurse education so that nursing students are prepared for the collaborative requirements in the nursing profession. One way to do this is to introduce educational models that can be applied in both campus-based education and in clinical practice. CL, as represented by several collaborative educational models, has shown the ability to support student learning development (Dillenbourg et al., 2007). In CL, students practice collaboration by teaching and learning from and with each other and by providing feedback to each other (Boud et al., 2014). However, reported challenges to the model have shown that collaboration can be complex and challenging with competitive relationships, bullying, and anxiety connected to group performances (Aase et al., 2014; Stenberg & Carlson, 2015; Zhang & Cui, 2018).

To overcome these complexities and to find solutions for development, the students' collaboration and the collaborative process need to be explored in the environment where the interactions take place (Berger et al., 2019; Emich, 2018; Zhang & Cui, 2018). However, it is unclear how students develop competence in the domain of collaboration (Evans, 2020). In nursing education, collaboration between nursing students has foremost focused on students' professional development in clinical practice and has only been sparingly studied in campus-based settings. This thesis is expected to contribute to the knowledge gap in nursing students' collaboration and the collaborative process in campus-based clinical skills labs. Such knowledge can help develop scaffolding interventions that can overcome challenges and can advance the pedagogy in CL and thereby prepare students for the collaboration required in the nursing profession and thus ensure patient safety. Considering collaboration as a set of generic skills, the results from this thesis may be applicable in other healthcare education settings, both in national and international contexts.

AIM

The overall aim of this thesis was to explore the collaboration and the collaborative process between bachelor nursing students during clinical skills lab practices from the perspective of nursing students and nurse educators and the use of formative peer assessment in higher healthcare education programs.

Specific aims

- To compile research of formative peer assessment in higher healthcare education.

- To explore collaboration between first-year undergraduate nursing students in a three-year bachelor program during clinical skills lab practices.

- To explore the collaborative process between first-year undergraduate nursing students in a three-year bachelor program during one semester of skills lab activities.

- To understand the variety of nurse educators' conceptions of nursing students' collaboration in clinical skills lab activities.

METHOD

The thesis took an exploratory approach comprising a scoping review (study I) with a published scoping protocol and three qualitative empirical studies, including a focused ethnographic study (study II), a narrative inquiry (study III), and a phenomenographic study (study IV). An overview of the methodology is presented in table 1.

Table 1. Overview of the methodology in the included studies (I-IV).

Phenomenon under investigation	**Design**	**Method for data collection**	**Data analysis**
I. Formative peer assessment in healthcare education	I. Scoping review	I. Systematic search in databases	I. Deductive semantic thematic analysis
II. Collaboration between nursing students	II. Focused ethnography	II. Participant observations and field-notes. Focus groups	II.Thematic network analysis
III. The process of collaboration between nursing students	III. Narrative inquiry	III. Field-notes and focus groups	III. Narrative analysis
IV. Nurse educators' conceptions of nursing students' collaboration	IV. Phenomeno-graphy	IV. Individual interviews	IV. Phenomenographic analysis

Design

Study I

Study I was designed as a scoping review. Scoping reviews aim to map the concepts, main sources, and available evidence in a specific field (Arksey & O'Malley, 2005). Scoping reviews provide an opportunity for including broader questions and a greater variety of questions in comparison to systematic reviews (Arksey & O'Malley, 2005). The included questions in the study were, (1) What are the rationales for using FPA in healthcare education? (2) How are FPA interventions delivered and in what context? (3) What experiences of FPA do students and teachers in healthcare education have? (4) What are the outcomes of FPA interventions? A further reason for conducting a scoping review was that it could provide identification of gaps in the research field (Davis et al., 2009) and could thereby direct further questions for the thesis.

The scoping review followed the six-stage process presented by Arksey and O'Malley (2005) along with consultation as recommended by Levac et al. (2010). The review was preceded by a scoping protocol describing the methodology plan for the review using the Preferred Reporting Items for Systematic and Meta-Analysis Protocols (PRISMA) (Moher et al., 2009). The protocol was conducted with the aim of limiting the risk of bias and providing transparency by defining the aim and the methodological positions of the review (Peters et al., 2015). The protocol further presented a guide for the search strategy, and the research questions were structured by using the recommended mnemonic PCC (Population, Context, and Concept) (Peters et al., 2015).

Study II

Study II was designed as a focused ethnographic study to answer the research question of how nursing students collaborate with each other during clinical skills lab practices. The research question was guided by the results from study I, which revealed the complexity of the students' interactions and collaboration in FPA. Because similar results had been presented in previous research on CL (Aase et al., 2014; Stenberg & Carlson, 2015; Zhang & Cui, 2018), it seemed important to explore the collaboration between students before conducting further investigations into FPA. Ethnography is suitable for exploring processes, methods, behaviours, and perceptions that occur within a group in a specific socio-cultural context (Hammersley & Atkinson, 2007), and focused ethnography is specified for nursing research when the purpose is to study the practice of nursing as a cultural phenomenon and how members of that culture describe the meaning of their experiences (Roper & Shapira, 2000). Furthermore, it is a recommended design when the study is conducted in a smaller community, focuses its observations on a specific topic, is conducted during a short period of time, and when the observer possesses previous knowledge of the context (Knoblauch, 2005).

Study III

Study III was designed as a narrative inquiry according to the theory of Polkinghorne (1995). Narrative inquiry is suitable for understanding human actions such as the collaborative processes. The inquiry takes place over time in a specific context and embraces both the researcher's and the participants' experiences (Clandinin & Caine, 2013). The 'narrative' is synonymous with the term 'story', and the story has a time sequence of a beginning, a middle, and an end that provides an opportunity to describe a process or a development (Polkinghorne, 1995)

Study IV

Study IV took a phenomenographic approach as presented by Marton (1981). Phenomenography originates from educational research and strives to explore the different ways people understand a phenomenon in their daily lives (Marton, 1981; Marton & Pong, 2005). In phenomenography it is the variation of the understanding of the phenomenon that is under investigation (Marton, 1981). By describing the variation of nurse educators' conceptions of nursing students' collaboration in skills lab practice, nurse educators' critical aspects of the phenomenon can be visible and can thereby be applied in the development of nursing education (Marton, 1981). Phenomenography does not explain how something is, which is referred to as the first-order perspective, and instead the method takes a second-order perspective to describe how something is conceived. In phenomenography it is the collective understanding of the phenomenon that is explored rather than the individual understanding (Marton, 1981). The various conceptions in phenomenography are presented as a set of descriptive categories that are qualitatively different from each other and that represent an outcome space (Marton, 1981).

Setting

Study II and III

In study II and III the setting was a campus-based clinical skills lab where students from year one in the bachelor nursing program practiced technical skills. The skills lab refers to specific rooms that are modelled and equipped to mimic a hospital room or a ward. Here students practice the skills required in clinical practice and in their professional life as nurses. Practicing in a clinical skills lab has a long tradition in nurse education and is represented by technologies with computers and mannequins that can simulate real life situations. The environment further provides opportunities to practice collaboration between students in small groups (Havnes et al., 2016; Jeppesen et al., 2017), which was the main reason for conducting the observations in the skills lab. The setting further provided an opportunity to follow the students for a whole semester.

Practice in the skills lab was preceded by lectures introducing the different skills the students were about to practice, and the students watched educational films available on a learning platform. When attending the skills lab, the students were obligated to wear scrubs provided by the faculty and they had to follow the hygiene routines stipulated for healthcare professionals. In the beginning of the semester the students practiced feeding and basic hygiene routines such as making the bed, washing, and ensuring oral hygiene. The practice was facilitated by a written case explaining the patient's situation and symptoms. The peer practice included the students observing and providing feedback to each other.

In mid-semester the students proceeded to practice more technical advanced skills such as venous blood sampling, injections, intravenous cannulation, and urinary catheterization, also supported by written cases. The students' peer practice included assisting, observing, and providing feedback. The end of the semester included scheduled optional practice and an individual objective structured clinical examination. The examination included feedback provided by the students and the nurse educator. All parts of the practices were mandatory, and passing the examination was required for attending the clinical practice the following semester according to the course requirements.

Study IV

In study IV individual interviews were conducted with nurse educators from five different universities in the southern parts of Sweden and with experiences from skills lab practices in nurse education programs.

Participants

Study II and III

The participants in study II and III were first-year bachelor of nursing students in a three-year nursing program. The course had 140 registered students, and they were allocated into 16 groups when practicing in the skills lab. They remained in their assigned groups throughout the course. All first-year nursing students admitted to the program received verbal and written information about the study visualized by a PowerPoint presentation. The information included the purpose, the method, and the publication of the study. The written information was also published on the students' educational platform, to which all students in the course had access. Of the 140 students, 108 gave their consent to participate in the study. Consent was required from all students in a group to be included because the study aimed to observe collaboration on the group level. Therefore, the final inclusion ended with 87 nursing students divided into 11 different groups. Choosing to conduct the observations in the first year was because the course started in the first week of the nursing program and ran to the end of the first semester, which provided an opportunity to follow the students during a period when the students initially did not know each other.

Study IV

Recruitment of respondents for study IV was conducted by contacting the head of department at universities offering nurse education and asking for contact information for a person in the organization who could act as a gatekeeper. The gatekeepers from the respective universities provided information about possible respondents and their e-mail addresses. The e-mail sent to the respondents included information about the purpose of the study and relevant information about the study. A total of 16 faculty-employed nurse educators with experience of teaching nursing students in skills lab responded. Of the participants, 14 were women and 2 were men. The age ranged from 36 to 56 years (mean 46 years). The nurse educators had been employed at the university between 11 months and 11 years (mean 4 years). All participants had a background as registered nurses, of which seven had a postgraduate education in specialist nursing. The positions of the participants included lecturers (10), of which two were doctoral students, associate senior lecturers (3), senior lecturers (2), and one associate professor. The teaching assignment in the skill lab comprised teaching, facilitating, supporting, assessing, and grading the students.

Data collection

Study I

Data in study I were collected by searching in public databases, consistent with the systematic procedures for systematic reviews and meta-analyses and following the procedures for scoping reviews (Arksey & O'Malley, 2005; Levac et al., 2010). The identification of relevant databases was conducted with support from a faculty librarian and included PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Education Research Complete (ERIC), and Education Research Centre (ERC). Search for grey literature (e.g. books, discussion papers, posters, etc.) was searched in Google Scholar, Lib Search, and Science Direct.

The inclusion criteria were (1) articles addressing FPA in higher education, (2) articles including students and teachers in medicine, nursing, midwifery, dentistry, physical or occupational therapy, and radiology, and (3) peer-reviewed articles and grey literature. Grey literature refers to books, chapters in books, discussion papers, posters, theses, etc., and is expected to be included in the search in a scoping review (Arksey & O'Malley, 2005; Levac et al., 2010). The included higher healthcare education programs were chosen because of their common assignments in healthcare and because of the availability of published studies identified in the initial search for the scoping protocol. Exclusion criteria were studies of summative peer assessment, studies of instrument development, and systematic reviews. All studies indexed in the four databases and in the free text search for non-indexed studies were included, and no limitation was set for the year.

A broad search was carried out to capture the range of published literature. Three search blocks according to the PCC (Peters et al., 2015) were organized and finally merged by using the Boolean operator AND, resulting in the identification of 1594 studies. Additional searches from other sources, such as Google Scholar, Lib Search, and references lists, identified 76 studies. For rigor, a librarian with expertise in systematic searches was consulted for a final check of the search blocks and the correctness of the systematic approach. The librarian further advised on how to structure the data in a reference management system to facilitate the handling of the data. To ensure transparency, the final search strategy was exemplified from the search conducted in PubMed and can be found in the published supplementary material of study I along with the charting form that was used to facilitate the screening of the studies. The last search was conducted in May 2019. For transparency, a PRISMA flow chart presented a visualization of the process starting from the studies that had been identified in the systematic search, the reason for exclusion, and the studies included in the final result.

Charting of the data was organized by constructing a charting form that supported the screening of the full-text articles. Out of 81 studies, 37 met the inclusion criteria and were appraised for quality using the Critical Appraisal Skills Programme (Critical Appraisal Skills Programme, 2018). Additional tools were used for cross sectional studies (Peters et al., 2015) and studies with mixed method designs (Hong et al., 2018). High quality was decided when “yes” was answered to most of the appraisal questions, and if “no” dominated the study was excluded. The screening process was a team effort with all members of the research team involved and with independent screening of the studies using the

Rayyan system for systematic reviews (Ouzzani et al., 2016). The critical appraisal resulted in 18 studies with high or moderate quality.

For transparency an overview of the included studies was presented in a table including information regarding author, year of publication, country and journal, the aim of the study, study design, participants, main findings, and the appraised quality of the study. For methodological rigor a consultation with an expert group was conducted with the goal of enhancing the validity of the results (Levac et al., 2010). The group consisted of nine academic teachers with experience within the field of healthcare education and pedagogy. The consultation was structured as an introduction to the proceedings of the scoping review and with a presentation and visualization of the preliminary results. The group discussed and responded based on specific questions recommended for consultation by Maguire and Delahunt (2017).

Study II and III

Data in study II and III were collected through ethnographic fieldwork. The fieldwork was performed through participant observations and focus group discussions regarding first-year nursing students' collaboration during skills lab practices.

Participant observations

The observations were initiated by conducting a three-hour pilot observation. The aim of the pilot observation was to get a first impression of the environment and how to write field notes and at the same time observe the students' collaboration. The pilot observation provided valuable information about where to be placed in the room so as not to be the centre of attention but still have a good overview of the room and to be able to capture the conversations going on without disturbing the students or the teacher. The pilot observation further provided insight into how to structure the fieldnotes. The fieldwork was conducted strictly as observational and without any interactions with the students during their practices. The reason for not interacting was because the environment and the organization of the practices in the skills lab did not present any opportunities for discussions or interactions during the practice. The fieldnotes were transcribed directly after the observations in order to prevent the risk of memory bias. The fieldwork was conducted between January and May 2020 and was performed during 70 hours of observation on 24 different occasions and with nine different educators present in the skills lab.

Focus group discussions

Focus group discussions were conducted after the course had finished and the students had taken the examination. The reason for conducting the focus groups was because the observations had been strictly observational and without any communication with the students. The discussions provided an opportunity to interact with the students and ask follow-up questions of what had been observed during the fieldwork. The students were also provided with an opportunity to express and share their own feelings and experiences. Study II included two focus groups with six nursing students who were present during the observations in the skills lab. Study III included four focus groups. The discussions were conducted via the digital tool Zoom, which has been shown to provide a feeling of comfort and to reduce formality (Oliffe et al., 2021).

Study IV

Data were collected through individual interviews with nurse educators who had experience of teaching in skills lab practices. A pilot interview preceded the interviews and was conducted with the goal of critically appraising the interview questions (Kvale, 1996) and to check the quality of the recording. The pilot interview was not included in the analysis due to the risk of bias because the interview was conducted with a colleague from the same university as the research team. The interviews all started with the question: “What is your opinion on students´ collaboration during skills lab practices?” The interviews were conducted between November 2023 and February 2024, recorded via Zoom, and lasted between 47 minutes and 95 minutes (mean 69 minutes) and were transcribed verbatim.

Analysis

Data were analysed using four different methods: thematic analysis (study I), thematic network analysis (study II), narrative analysis (study III) and phenomenographic analysis (study IV).

Thematic analysis (study I)

The analysis was conducted with semantic thematic analysis according to the methodological step-by-step recommendations of Braun and Clarke (2006) and with practical guidance as presented by Maguire and Delahunt (2017). Thematic analysis was chosen because it presents a method for identifying, analysing, and reporting patterns within data (Braun & Clarke, 2006) and allows the inclusion of studies with both qualitative and quantitative methods (Mays et al., 2005), as was the focus of interest in this study. A further reason was that the method allows for a large amount of data (Braun & Clarke, 2006), which often is a result of scoping reviews because of the broad or multiple questions. An initial familiarization with the data was obtained by reading all articles to get a first impression of the results of the included studies. The results from the studies appraised as having moderate and high quality were deductively coded (Braun & Clarke, 2006) guided by the research questions. The articles were read again before the initial coding, which consisted of short descriptions close to the original text. The codes were combined into themes and subthemes and were identified with a semantic approach, meaning that they were explicit and did not represent anything beyond what was written. A thematic map of the themes was constructed, which provided an overview of how the themes related to each other and supported the presentation of the narrative (Maguire & Delahunt, 2017).

Thematic network analysis (study II)

In study II the analysis was conducted by using thematic network analysis as presented by (Attride-Stirling, 2001). In this form of thematic analysis, a visual representation of the data findings is presented as a network. The aim of the analysis is to understand social phenomena and dynamics (Attride-Stirling, 2001), and this was considered suitable when analysing how nursing students collaborate with each other. The analysis of the data involved the interpretation of meanings, communications, actions, body language, and consequences of activities according to an ethnographic approach (Hammersley & Atkinson, 2007). The analysis of the transcribed fieldnotes from the observations and transcripts from the two focus group interviews were interpreted as a unit in order to identify relationships in the material. The material was coded until saturation was reached and no further codes could be identified. The codes were then abstracted into basic themes, which are the lowest and broadest organization of themes in a thematic network analysis. Next the basic themes were brought together into similar organizing themes representing more abstract principles. Finally, the organizing themes were arranged in a global theme summarizing the principal metaphor in the text (Attride-Stirling, 2001).

Narrative analysis (study III)

A narrative analysis of the transcribed fieldnotes and four focus group interviews was conducted by using the theory of narrative configuration and emplotment as presented by Polkinghorne (1995, 1997). For guidance on Polkinghorne's theory, the interpretation of Price et al. (2018; 2013) was used. The story in a narrative analysis is held together by a pattern of events referred to as plots. Plots are part of a story that can represent special events or uniqueness in the data. The plot helps to connect observations with the students' expressed experiences in the focus groups and creates a context for understanding the meaning of collaboration. The first phase in the analysis was to read the transcripts from the observations and the focus groups as one unit of analysis. Thereafter the material was organized in a time sequence – (1) beginning of the semester, (2) mid-semester, and (3) end of the semester, including the examination. Each time sequence represented specific elements the students were about to practice. This helped when organizing the transcripts from the focus groups because the focus group discussions were not conducted in a chronologic order (Ylijoki, 2001).

Each time sequence was then separately coded, and the codes were clustered into tentative themes. The themes were then mapped in the order they appeared to identify the plot in each sequence. Finally, the plot from each time sequence was examined as a unit of analysis in order to identify the relationship between the plots, the uniqueness, the causality, and the similarities and differences over time (Polkinghorne, 1995, 1997; Price et al., 2018; Price et al., 2013). Because the story is the object in Polkinghorne's theory, the results from the narrative analysis were presented as a story in the manner described by Van Maanen (2011) as the impressionist tale.

The impressionist tale

The impressionist tale is inspired by classic impressionist painters such as van Gogh, Monet, and Renoir. Their paintings captured everyday scenes in a particular time and space without portraying the exact image of the scene but still making them recognizable and familiar to the viewer. In writing ethnography, the impressionist tale represents telling the story in the first person, keeping both the subject and object in view (Van Maanen, 2011). The aim is to let the reader of the story, without experience of the situation, feel, see and imagine what the fieldworker has felt, seen, and imagined during the fieldwork (Van Maanen, 2011). The intention is to tell a story from the beginning to the end and to give names and faces to the different characters without drawing an exact picture of them while still bringing them to life. In study III, the story was represented by one fictive student giving voice and thoughts to all 87 students who were observed and the 11 students' stories in the focus groups. The fictional characters surrounding the one student in the story are not to be seen as static. On the contrary, they play a significant role in the plot by giving representation to the observed and collected data (Van Maanen, 2011).

Phenomenographic analysis (study IV)

In study IV the analysis was performed by following the seven-step procedure of phenomenographic analysis as presented by Dahlgren and Fallsberg (1991). Familiarization was conducted by listening to the interviews and reading the transcripts in comparison to the written memos that were taken during the interviews. Condensation of significant statements was then done by marking meaning units in the text. As previously mentioned, phenomenography is the collective understanding of the phenomenon rather than the individual understanding (Marton, 1981), and thus the marked units were copied into a joint document for further analysis. In the next step significant statements were compared to identify agreements and differences, and similar statements were then grouped together as conceptions (Dahlgren & Fallsberg, 1991). The conceptions were distinct from each other, and the essence of each conception was articulated in categories. The core meaning of a category was identified by labelling the descriptive categories. In the last step the descriptive categories were contrasted to identify similarities and differences in the data. Each descriptive category was then related to the other categories and presented in an outcome space (Marton & Booth, 2013). The outcome space formed a larger, hierarchical understanding of the phenomenon (Marton & Booth, 2013) of nurse educators' various conceptions of nursing students' collaboration. The outcome space presents an hierarchical structure that is logical in the sense that the most complex category represents the category from which the others can be understood, but not the other way around (Åkerlind, 2023).

ETHICAL CONSIDERATIONS

The studies in this thesis complied with the ethical principles of the Declaration of Helsinki (World Medical Association, 2024). Ethical approval was not required for study I because the data were extracted from public databases. In study II and III, ethical approvals were provided by the Ethical Review Board in Sweden (Dnr 2019-04474). A supplementary ethical approval was provided by the Swedish Ethical Review Authority (Dnr 2022-02516-02) for study IV because nurse educators were not included as participants in the application for study II and III. All personal data in study IV was handled in accordance with the General Data Protection Regulation (GDPR 2016/679).

Written information about the studies was sent to the head of department of the respective universities included in the studies, and a written consent to carry out the study was obtained (II, III & IV). In study II and III, the students were informed, both verbally and in writing, about the background and aim of the study. The information emphasized that the observations focused on the students' collaboration with each other and not in any sense how the students performed the practical skills. They were also informed that no one in the research team was involved as teachers during the semester. The students were informed that participation required their written consent, meaning that they had the right to withdraw without any explanation or risk of consequences. Despite the information, there was a risk that the students did not know what they agreed to be part of, or to refrain from. Therefore, the information was repeated when meeting the students in the skills lab for the first time (II & III).

For study IV the nurse educators were informed in written information about the study that participation was voluntary and that non-participation would not affect the individual educator in any sense. Written consent was obtained before the interviews. All interviews started with repeated information about the purpose and background of the study, and the participant was informed that they had the right to withdraw or not answer without any explanation or risk for consequences.

Reflexivity

Reflexivity concerns trustworthiness in qualitative research and means that the researchers reflect on how social positions, perceptions, and understandings may have affected the participants and the researcher and thus the final results (Teh & Lek, 2018).

Previous experience of being a registered nurse with several years of lecturing in nurse education and working with collaborative students in skills lab and in clinical practice involved different ways of relating to how this preunderstanding may have affected the respective studies. Different measures were taken depending on the design of the studies and on the situations arising during the data collection. In ethnographic studies, these preunderstandings are put in the foreground rather than in the background (Hammersley & Atkinson, 2007). This is especially the case in focused ethnography (study II and III), where previous knowledge and experience of the field and culture under investigation is of particular importance because observations are conducted during a short but intensive period of time (Knoblauch, 2005). Familiarity with the setting facilitated the observations because no efforts were needed for getting acquainted with the setting, and the focus could be placed solely on the students' interactions and conversations. However, there is a risk that familiarity hinders the observation of actions and details that might have been identified by someone without prior knowledge of the context (Knoblauch, 2005). Reflective notes taken during the observations and constant reflections with the supervisor team, who possessed no previous experiences of the context, helped to identify any presumptions from the author.

An ethical challenge of study II and III was that all students in the group had to give their consent to participate, and if not the entire group was excluded. No guidance was found in the literature on how to handle inclusion/exclusion when observing groups. The decision was to exclude the groups if not everyone had given written consent because it was not possible to "not" observe a specific student or students. On the one hand, this decision meant that the students in these groups who had agreed to participate did not get the opportunity and were excluded, and there is a possibility that their participation could have provided further knowledge about the phenomenon. On the other hand, they had the opportunity to participate and share their experiences in the focus group discussions where all the students were invited. Furthermore, even if not formally required, the educators who were responsible for the skills lab practices during this period were informed separately from the students about the study (II & III). This seemed important and morally correct even though they were not the object of the study and were not included in the ethical application. Regardless, they would have a colleague present and with respect to the feeling this might create it seemed important to present the role as an observer.

Being in the field for quite a while will mean that unexpected events can happen, referred to in ethnography as serendipities (Lähdesmäki et al., 2021). Such an incident happened during the pilot observation (II) when one of the students in the group approached the researcher and asked to read the written field notes. The request was kindly rejected, but the situation provided an example of reactivity and the observer's influence on the observed even if trying to be as "invisible" as possible (Hammersley & Atkinson, 2007). However, the more time spent with the students seemed to build a report that was also reflected and confirmed by one of the educators during the skills lab practices.

In addition, there was a situation (II) when a student kindly asked not to be observed because of having "a bad day" in reference to the practice of the technical skills. The purpose of the observations, that the observations did not focus on the performance and only on the collaboration between the students, was repeated to the student, which the student seemed to accept. However, the situation could have been prevented by following the advice of Roper and Shapira (2000) and repeating the purpose, not only for informed consent, but during the procedure in order to create a comfortable situation for everyone involved. A similar situation happened during the focus group interviews (II) when a student asked the interviewer (the author of this thesis) to persuade the course management to let the students remain in their study groups for the next semester. This may indicate that the students identified the interviewer as an educator with a mandate and power to influence their education, even if this was not the situation, and that participating in research opens up for the possibility to express one's own wishes rather than just contributing to the research (Myerhoff, 1980).

In study IV the social positions of both interviewer and interviewees were shared in the sense that all were university employees in nurse education programs and with earlier or present experience of teaching assignments in clinical skills labs. Collegiality seemed to provide comfort in the individual interviews for all involved and to provide a feeling of a discussion between equals rather than an interview. The educators seemed willing to share their understanding. However, there was a risk that the understanding of what the interviewee described could be taken for granted because of the mutual understanding of the context. In the same way, the interviewee might describe a situation or an event by referring to it is as "you know what I mean". To reduce this risk, the use of prompting questions was of utmost importance to ensure that the understanding was correctly perceived (Kvale et al., 2014). Summarizing the interview at the end also reduced the risk of presumptions and gave the interviewee the possibility to correct any misinterpretations (Kvale et al., 2014).

The collegiality could further have enhanced the risk of social desirability bias, meaning a desire to present things in a way that are perceived as socially acceptable rather than reflecting one's reality (Bergen & Labonté, 2020). This could be sensed in a few interviews and seemed to be associated with the interviewee's knowledge of the interviewer's previous efforts in the field of CL. Having a positive or a negative attitude toward CL could in both ways have affected what was shared in the interview and thereby affected the results. However, using an indirect questioning technique, probing questions, and neutral responses helped to minimize this risk (Bergen & Labonté, 2020).

RESULTS

In the following section the results from studies I–IV are presented. The results from the scoping review of FPA (I) guided the subsequent empirical studies (II-IV). The comprehensive results from the studies (I-IV) fall within four major themes, *The educational organization of collaboration and FPA*, *The instructional directives for the collaboration and FPA*, *The field of tension in the collaboration*, and *The development process of nursing students' collaboration.*

The educational organization of collaboration and FPA

The educational organization concerns the purpose and the rationale of collaboration and FPA. The scoping review (I) showed that students do not always understand the aim of FPA, and they believe that the faculty have a responsibility to clearly state the aim of the peer feedback activities. The rationales for FPA were identified as either being pragmatic, educational, or prospective. The pragmatic rationale was associated with cost-benefits. Having students assess and provide feedback to each other requires fewer educator resources, and students can support themselves by creating learning activities instead of this being done by the educators. The educational rationale of FPA is associated with benefits for developing students' learning. By letting the students give and receive feedback supports not only their learning, but also enhances their critical thinking, helps identify knowledge gaps, promotes understanding of the assessment process, and develops critical and interpersonal skills. The prospective rationale is related to how FPA prepares students for professionalism in the healthcare professions. When the students observe each other, they can identify vital skills as professional and unprofessional behaviour, clinical and technical skills, evaluative judgement, communication skills, and collaborative behaviour (I).

Parallels to the above-described ideas can be found in the results of nurse educators' different conceptions of the purpose of student collaboration during skills lab practices as being either pragmatic, educational, or prospective (IV). The pragmatic reason for having two or three students interacting with each other relates to the practical way of organizing skills lab practices. The nurse educators described how increased admission of students, and a reduction of teaching hours made it necessary to have students in small groups. Having students in small groups was perceived as time saving because the students could support each other instead of the educator. By allocating students with previous experiences from healthcare to support students lacking such experience was further expressed as a pragmatic way to organize the collaboration in the skills lab (IV). Students who had previous knowledge also took on the role of leading the collaboration (II). The centre of attention was not the collaboration between the students but the practice of technical skills (II, IV).

The educational purpose of collaboration was associated with providing support for student teaching and learning (IV). Existing educational models such as peer learning, problem-based learning, and active learning were mentioned by educators as forming a pedagogic framework. The prospective purpose of collaboration was expressed by educators as being important to prepare the students for the collaborative requirements in the profession. Their own experiences as registered nurses were referred to, and they emphasized the necessity of having collaborative skills in the profession. Integrating collaboration early in the education and with a continuum throughout the education was conceived as being important to prepare for future collaborative requirements in the nursing profession (IV).

The instructional directives for collaboration and FPA

The instructional directives for collaboration (II, III, IV) and FPA (I) included preparations, introductions, and instructions, and these were seen as important by both students (II) and educators (IV). Students emphasized the importance of being prepared for the collaborative requirements during the skills lab practices and the need for guidelines on how to give and receive feedback (I, III, IV). Not least, a need for guidance was mentioned to support constructive feedback because the students were afraid that the feedback they provided could be seen as criticism by fellow students (II, III). Educators, in contrast, expressed different approaches to the need for instructional directives for collaboration (IV). On the one hand they considered that there was no need to prepare or introduce collaboration because they assumed that adult students had such ability. Instead, preparations and introductions focused on the practice of the technical skills. On the other hand, there were educators who thought that an introduction to collaboration is vital for the sessions in the skills lab. The introductions included expectations related to students' collaboration and could include codes of conduct that students were expected to adhere to during the practice in the skills lab as well as instructions for peer observations and feedback (IV).

Further preparations for the collaboration were associated with the organization and the group affiliation, which were of major concern for both students (II, III) and educators (IV). When the students had the freedom to choose for themselves who they wanted to collaborate with, this resulted in homogeneous groups (II, III, IV). The students seemed to seek peers in people like themselves to collaborate with, and this was observed for age, sex, and ethnicity (II). In the beginning of the collaboration when the students did not know each other it was stressful to find a peer. There was a fear of not being chosen as a peer and thereby risking ending up alone (III), which also became a reality for some students (II, IV). Homogeneity in the group constellations was further represented by different motivations for learning (III, IV). Study-motivated students appeared to seek each other, as did students who seemed less study motivated (II). The exception from homogeneity was students with previous experiences from healthcare, and they were observed in different groups and did not seem to specifically seek each other out (II). The educators' conceptions of how to compose the groups during the practices in skills lab varied (IV). Some thought students should choose for themselves because this could help them to feel safe and secure in the situation. Others found it valuable to organize the groups so that each group included a student with previous healthcare experience with the reasoning that they could support the students who did not possess any prior knowledge from healthcare. Finally, some believed that group affiliation should be conducted by the educators to ensure that the groups are randomly assigned so that the students will learn to collaborate with different personalities as preparation for real-life collaboration in the nursing profession. The argument was that in the profession one cannot choose one's co-workers and one is required to collaborate with everybody in order to provide the patients with the best nursing care (IV).

The field of tension in collaboration

The collaboration between first-year nursing students during skills lab practices was represented by a field of tension between adaptation and non-conformity (II) (figure 2). On the one hand, adaptation represented how the students could readily adapt to others, to new knowledge, and to being a nursing student. The students negotiated and discussed with each other. By communicating and alternating between listening and speaking they planned their actions, which facilitated a flow in the performance and made feedback a natural element of the interaction. By being well prepared for practice and by negotiating, a rhythm was created in the collaboration that made the practice more time efficient. The students supported each other by providing tips and hints, and they created a supportive atmosphere by being open to each other about feelings and insecurity, which together created a sense of trust among them. Students being informed and having evident nursing knowledge could express constructive feedback to their fellow students (II).

On the other hand, non-conformity in the collaboration was represented by the students having difficulties accepting the perspective of others, finding mutual goals, sharing decisions, and providing supportive and constructive feedback (II). Self-appointed leaders made all the decisions without discussing and consulting with their peers. Some students came unprepared for practice even if being obligated to be, which created disharmony with a non-synchronized performance. This was time consuming because the students had to recap before they could proceed with the activity. Furthermore, being un-prepared hindered the students from taking part in the discussion with the consequences of being perceived as un-committed. Mistrust was created when students were misinformed and argued without having evident knowledge or when they were not honest in their feedback or did not act in a supportive way (II).

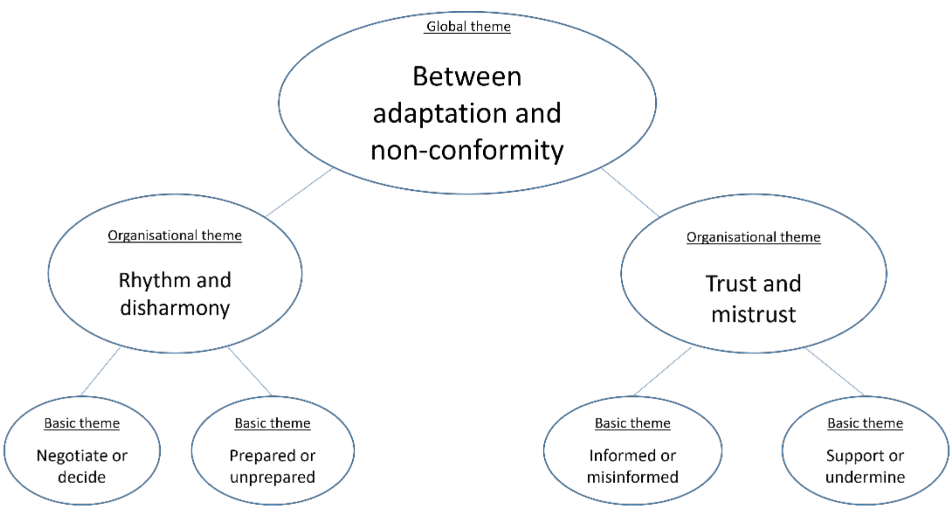

Figure 2. Thematic network visualising the collaboration between first year bachelor nursing students (II).

Similar statements to the above-described field of tension in the collaboration were expressed by the nurse educators because the individual student's skills and the group activity skills have an impact on the collaboration (IV). The educators mentioned how students' attitudes to participating in group activities, being a team member, and participating with others affected the collaboration. The group activity skills were expressed as being supportive when students showed respect for each other's knowledge and contribution. The acts of communicating, asking questions, instructing each other, planning together, and providing feedback to each other created peer support and a flow in the performance. Behaviours such as being motivated, showing interest, and being ambitious and engaged were, according to some of the educators, associated with building trust between the students (IV). The educators found it important that students came prepared for the practice because they felt that students not being prepared may be perceived by other students as free riders who do not contribute to the collaboration (IV). The students, for their part, found preparation to be important because it provided them with a sense of control in situations and prevented them from making mistakes and losing face in front of others (II). The outcome space of the nurse educators' conception of student collaboration showed the hierarchy between the educational, organizational, and individual and group activity skills (IV) as presented in figure 3.

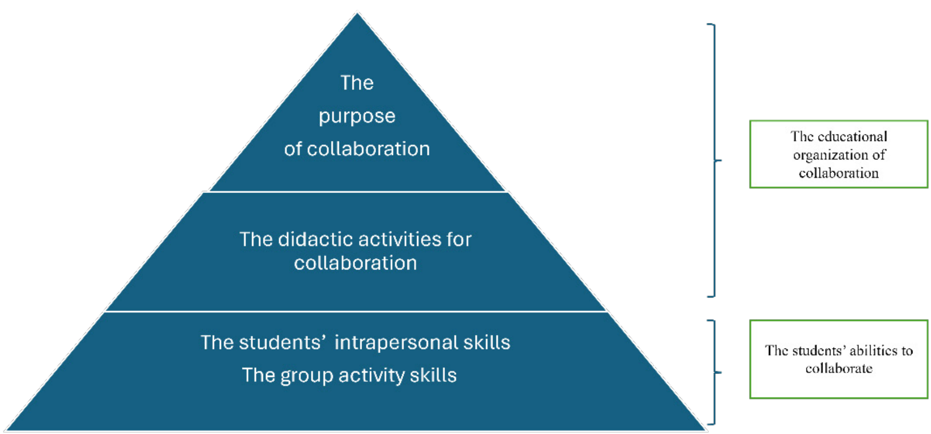

Figure 3. The outcome space of nurse educators' conception of nursing students collaboration during skills lab practices (IV).

The development process of collaboration

The fourth theme represents the development process of collaboration between the students during the skills lab practices (III). The process started with the students' navigation in unfamiliar territory representing the beginning of the journey when the students faced a new environment, unfamiliar to several of them, for the first time. The one thing unifying the nursing students in the skills lab at the very start was that they all were wearing scrubs. In the beginning they did not know each other, which was stressful when they were told to arrange themselves into small groups of two or three students. The stress was connected to the fear of being left without a peer to practice with and not being included in the student community (II, III). Students having previous experiences from healthcare thought they had advantages, and self-confidence made them take the lead in the performance, but not always by including others or by using evident nursing knowledge (II, III). Students without healthcare experience found this stressful and thought of them as being superior (II). A further stressful moment was when the students were asked to provide feedback on their peers' performances once they had finished a particular task. Not yet having the medical language, nor any knowledge or guidance, made it difficult for the students to formulate constructive feedback (II, III). The absence of a common language made the feedback superficial. The students were afraid that the feedback would be perceived as criticism and thereby risk the relationship between the students (III). Similar statements were found in the scoping review of FPA where students expressed worries that the feedback provided might lead to negative consequences for their social relationships (I).

In mid-semester the students began to navigate together to cope with the tasks (III). The task they were about to perform now represented more complex nursing interventions than those the students performed in the beginning of the semester. The complexity of the task triggered collaboration, and the students found that they needed each other's competencies and support to overcome the challenges connected to the task. Even students with experiences from healthcare now needed their fellow student colleagues to be able to complete the task (III). At this point the group constellations had become established and were represented by homogenous groups with the consequence of some students being left out of the collaboration (II, III).

When approaching the end of the semester, the students were navigating together to approach independence and their future nursing profession (III). Homogeneity was less dominant during this period. Instead, the focus of attention for the students was to pass the final exam. The students' concentration was more directed to their individual needs to practice rather than with whom they practiced. Earlier experiences from healthcare became less important during this phase of collaboration. The peer observations during the semester showed which students possessed evident nursing knowledge, which became more important than relying on those with previous experience from healthcare. The role of the educator also became less important and became more of a discussion partner than an instructor. The students used each other's knowledge, and they especially turned to those who had proven to have evident knowledge. The feedback had become constructive with suggestions for improvement and was facilitated by the development of the terminology of nursing (III).

DISCUSSION

The aim of this thesis was to explore the collaboration and the collaborative process between bachelor nursing students during clinical skills lab practices from the perspective of nursing students and nurse educators and the use of FPA in higher healthcare education programs. This section discusses the main results based on the theory of development from the Zone of Current Development to the Zone of Proximal Development by Vygotsky (1980), and presented in figure 4.

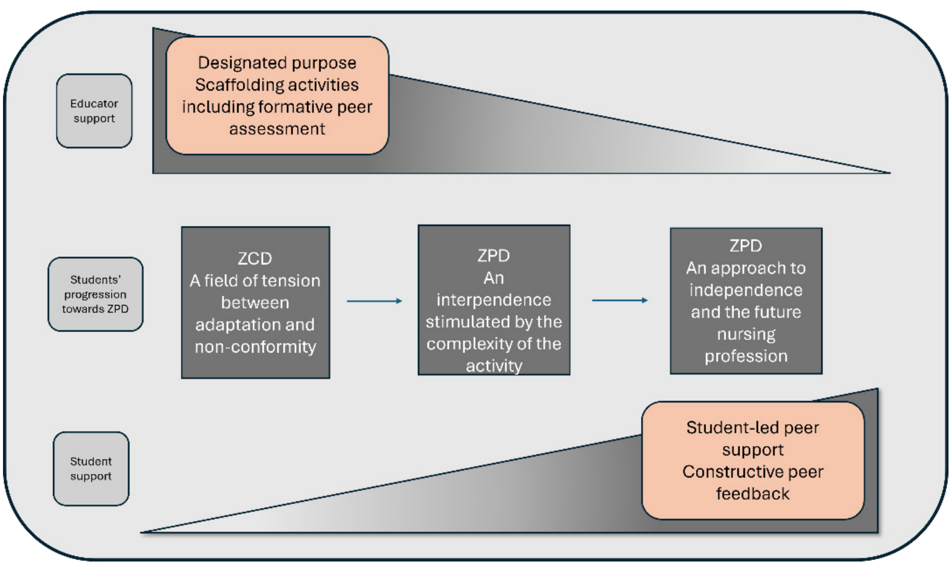

Figure 4. Positioning first year nursing students' collaborative process in the Zone of Proximal Development theory of Vygotsky (1980).

Collaboration in the Zone of Current Development

The ZCD of nursing students' collaboration represents the initial interactions between nursing students. In this early phase of collaboration, students' actions and educators' approaches to collaboration seem to interact, which can to some extent provide explanations for previously described complexities in CL (Aase et al., 2014; Stenberg & Carlson, 2015; Zhang et al., 2015). These complexities are visible in this thesis as a field of tension between adaptation and non-conformity in the students' actions (II) and provide an understanding of how different individual skills and group activity skills influence collaboration (II, IV). The described non-conformity, characterized by creating mistrust and disharmony among the students, guides what needs to be further developed. Furthermore, the students' insecurity of what is expected of them in the collaboration with each other and in the FPA, along with anxiety about being left out in the collaboration, indicates the vulnerability that this initial phase represents. However, the students' actions seem to coincide with faculty and educators' approaches to collaboration, which provides a greater context for the complexity of collaboration. What stands out is that students' ability to collaborate and communicate are taken for granted by educators, and these are equated with informal everyday interactions and talk. This leaves the students with an unstructured situation to be handled to the best of their knowledge, which eventually may lead to collision. Instead, and in agreement with previous research (Kaendler et al., 2015), collaboration needs to be practiced and organized by the faculty to ensure its proper development. This means that for collaboration to develop requires nurse education to recognize collaboration as a formal process in the same sphere as learning is recognized as a formal process in CL (Laal & Laal, 2012). Thus, the initial strategy for faculty should be to design the purpose of the collaboration due to its overarching importance in the educational organization of collaboration (IV). If the students are not offered an explanation for why they should collaborate with each other and how this skill can benefit them, they will probably not make the effort to do so. Thus, for collaboration to develop it needs to be understood by students and transferred by educators to what Vygotsky refers to as the cultural context (1980). This means that faculty need to design the purpose of collaboration to ensure more than just the benefits for learning, but also in connection with its application in the nursing profession.

By providing the students with an explanation of why they should collaborate and how it will benefit them in their future profession may enhance their engagement, which is in line with Vygotsky's suggestions of instructions as prospective (1980). A designated purpose could further prevent a 'random' pedagogy and instead create a common and evidence-based approach in teaching, as has been highlighted in previous research (Herodotou et al., 2019; Webera et al., 2021). More so, by providing guidance and a designated purpose, scaffolding activities for the collaboration can be identified that can further provide a common approach in teaching and thereby act as support for both students and educators (Stenberg et al., 2020).

Scaffolding activities for collaboration

By exploring collaboration (II, IV) and the collaborative process (IV), scaffolding activities have been identified that represent facilitating interventions that can provide support for collaborative development. Thus, scaffolding activities act as mediators for the development and as artefacts (Vygotsky, 1980) because they involve measures from which educators can organize the collaboration. This is consistent with the contingency described by Van de Pol et al. (2019), meaning that the activities need to be prepared and introduced to the students. More so, because interdependence between the students is vital in CL (Johnson & Johnson, 1989; Kaendler et al., 2015), the activities form a foundation that not only structures the collaboration, but also creates opportunities for interdependence between the students (III). The complexity of an activity makes the students navigate together because they see that they need each other's competencies to cope with the task (III). Thus, the complexity of the task becomes a vital scaffolding activity triggering collaboration as well as stimulating the students to discuss and share their thinking (Child & Shaw, 2016). This was recognizable in how the students negotiated with each other, which created a flow in performance and facilitated the communicative and cognitive part of collaboration (II). Having students use each other's knowledge to a greater extent should make it possible for the educator to step back and allow interaction without too much interference (III) in this fading phase (Van de Pol et al., 2019).

Furthermore, scaffolding activities can prepare the students by reflecting daily collaborative activities in the nursing profession. For example, nurse educators can present students with clear instructions on how to negotiate their mutual goals in order to enhance accuracy in a collaborative activity (II). By challenging the students to prepare, plan, and agree on role division before taking action supports students for future planning with their teams in the nursing profession. However, for collaboration to develop, nurse educators need to take responsibility for group affiliation and challenge the students to interact in heterogeneous groups instead of preserving already established thoughts among like-minded individuals. Making the students to collaborate with peers they would not choose to interact with can further prepare them for the multiple and often complex interactions they will meet in clinical practice and in the nursing profession. This will also help to prevent the risk of some students being repeatedly excluded and preventing their early exit from education (II), as also noted by Hansen et al. (2020).

A further scaffolding activity for collaboration concerns the involvement of FPA (I). FPA is primarily described as a scaffolding activity for learning (Deiglmayr, 2018). However, FPA can be understood as a didactic activity supporting the communicative and reflective part of the collaboration. As such, FPA should be aligned with collaborative learning practices (I). In this sense FPA becomes a mediator for communication and is consistent with Vygotsky's development theory, which emphasizes the role of language as a mediator for development (1980; 2012). By altering the role of the observer and those being observed, the students can mirror their knowledge and development in their peers. However, in agreement with a previous studies, for FPA to become constructive students need guidance in the objective for the observations and for the feedback (Er et al., 2021; Fleckney et al., 2024). Providing the students with clear instructions can help to decrease the negative social factors and the anxieties in connection with FPA (I) and instead build trust among the students (II). Instructional directives for peer observations and feedback can further support the alignment of the feedback to the nursing profession and the ability to assess planned and performed activities and to communicate the results to patients and their relatives. Thus, scaffolding activities act as preparation for the interactions in the nursing profession, guidance for the practice in education, and as a mediator for students to reach their ZPD.

Collaboration in the Zone of Proximal Development

How students develop into a collective ZPD was understood through the narrative of first-year nursing students' collaborative process (III). The process involves a transition from educator dependency to student interdependence and finally transforms into a student-led approach leading to independence. The process provides an understanding not only of the students' development, but also the role of the nurse educator in the development process. Previous research has described the role of educators as important to support and facilitate the students' learning development in CL (Coetzee et al., 2018; Van Leeuwen Janssen, 2019). However, there is a risk that the role of the educator may be misinterpreted as a status quo, meaning that the same support is provided throughout all stages of the student's process. Instead, for students to reach their ZPD of collaboration different activities are required depending on where in the collaborative process the students are. This corresponds to how ongoing development changes the need for support in Vygotsky's development process (1980) and further corresponds to the characteristic of scaffolding as a process of contingency, fading, and a transfer of responsibility (Van de Pol et al., 2019). The role of the educator is of significance early in the collaborative process in order to take the lead and reduce the non-conformity that may occur in the collaboration between students at this stage (II). However, the responsibility needs to be transferred back to the students once the students have developed the necessary skills (Van de Pol et al., 2010). At this point the need for instructions for the collaboration and for the feedback seems to be of less importance (III). By this time the students should have found ways to use each other's knowledge and how to provide constructive feedback to each other. Furthermore, they focus more on the task ahead than with whom they are collaborating. This means that educators at this point can let go of organizing the groups and leave the responsibility to the students. By supporting each other, the students develop both independence and a collaborative approach to the nursing profession in their collective ZPD. This transfer of responsibility is further consistent with the framework for peer feedback presenting different levels of support by educators depending on where in the feedback process the students are (Er et al., 2021)

This thesis has foremost focused on first-year nursing students' collaboration (II) and the collaborative process from the ZCD to the ZPD during skills lab practices (III). However, for further development collaboration must be recognized as a lifelong learning skill required in a life perspective (Nayda & Rankin, 2008). This implies that nurse education needs to acknowledge collaboration as a core competence for nursing and for CL to be integrated as a continuum in education instead of being a stand-alone activity in a course.

Discussion of methodological considerations

The methodological considerations of this thesis are discussed within the frame of trustworthiness. Trustworthiness, or rigor, in the conduct of qualitative research pertains to the assessment and transparency of qualitative methods and uses criteria for credibility, dependability, confirmability, and transferability as outlined by Lincoln and Guba (1985).

Credibility

Credibility corresponds with the positivist concept of internal validity and refers to whether the presented results are congruent with reality and can be perceived as truthful descriptions and interpretations of the data (Shenton, 2004). To address credibility, methodological triangulation was adopted by using multiple methods to study the phenomenon of collaboration. Focused ethnography with participant observations was the main source of data to approach the phenomenon (II, III). Conducting focus groups and individual interviews further validated the information from the different perspectives of both nursing students and nurse educators and from different settings. Triangulation was also adopted by member-checking (Adler, 2022), and to ensure accuracy all members of the supervisory team were involved in reading the fieldnotes and interview transcripts and provided feedback on the analysis process and the results (I-IV).

To achieve transparency of the analysis, the search strategies were made public (I) and much data were published in tables in the manuscripts (I-IV). The visualization of the data was done in an attempt to show the process of the analysis up to the results as recommended to ensure credibility (Adler, 2022). Because of the risk of being too familiar with the phenomenon and the context under investigation, the transparency efforts were an attempt to reduce the risk of bias (Shenton, 2004). Presentation of the conduct of the work and the results to expert groups (I) and presentations at national (I) and international conferences (II, III) have further opened up the research project for scrutinization. Not least did the use of predetermined questions as provided by Maguire and Delahunt (2017) for the consultation in study I helped to organize the feedback from the expert group, which resulted in valuable input for revision of the themes. The empirical studies (II, III, and IV) were preceded by pilot observations and pilot interviews and focus group interviews in order to identify weaknesses and to increase the quality of the studies (Malmqvist et al., 2019).

Dependability

Dependability corresponds to the positivist concept of reliability and refers to the constancy of the data under similar conditions (Shenton, 2004). Study I was executed according to the initial plan presented in the published scoping protocol. Because none of the critical appraisal tools included criteria for ethics, this was added as a criterion with the reason that the assessment of ethical concerns is recommended because it enhances the validity, reliability, and generalizability of the research findings (Weingarten et al., 2004). A limitation of study I concerns how the critical appraisal of the included studies was addressed when presenting the results. A more thorough description of the quality of the studies included in the presentation of the results could have provided the reader with a more nuanced result related to quality. However, the aim of the study (I) was not to provide evidence, as in systematic reviews, but to map FPA in healthcare education programs and identify gaps in the available literature (Arksey & O'Malley, 2005).

To avoid subjective research in the coding (I, II & IV) and in the plotting (III), the procedures were approached by more than one person (Braun & Clarke, 2021). The author of this thesis coded all data and divided the material among the supervisory team for independent coding and plotting. The coding was then compared and discussed to ensure reliability in the coding procedures. In studies II-IV, detailed and chronological reporting of the gathering of data was presented as well as thick descriptions that reflect the participants' meanings and with quotes from the original representation of the data (II & IV).

The article for study III was initially written as a conventional reporting of the fieldworker's interpretation, and quotes were used to give voice to the participants (Van Maanen, 2011). However, once finished the narrative was found to be what Van Maanen (2011) refers to as 'an unpassionate story', told in third voice, without providing the reader with an impression of the collaborative process. Written as a story makes the results easily accessible to the students it concerns, and the use of ordinary language validates the results because every student in a collaborative environment can determine if the findings are plausible or not (Lincoln & Guba, 1988; Polkinghorne, 2007). The students can find themselves in the story, but they can also access an understanding of others or of the specific culture through the told story (Holley & Colyar, 2009). For educators the story can be used as material for introduction and discussions about collaboration in education. However, even though the story can be easily adapted because of the fictional way it is projected, this involves a challenging and complex methodological process. The challenge results from the fact that it is not fictional, and the interpretation of findings must be handled with scientific accuracy and rigor.

In study IV the variation of the participants was necessary to be able to understand educators' various conceptions of student collaboration. This was accomplished by including participants from five different universities, both men and women, with different ranges in years of employment, age, and position.

Confirmability

Confirmability refers to the objectivity of the data (Shenton, 2004). To prevent subjectivity, consultation was used to enhance the validity of the results (I). Studies II and III were conducted using participant observation. Because these were carried out without interaction or conversation between the observer and the students, focus group interviews were performed with some participants after the course in the skills lab was finished. The focus group interviews offered the opportunity to ask the participants questions that had been raised during the observations as well as to offer the participants the opportunity to describe their experiences, feelings, and impressions, which ensured respondent validity and reduced the risk of subjectivity in the interpretation of the results from the observations (Shenton, 2004). Confirmation of the analysis and the results of study II was further obtained when the results of teachers' perceptions of students' collaboration (IV) were consistent with each other.

Transferability

The nature of transferability refers to whether the results can be applied in other settings (Lincoln & Guba, 1988) and corresponds to external validity and the applicability for others (Merriam, 1998) . Presenting the search strategies in the databases in the scoping review (I) provides transparency and an opportunity to replicate the search in other studies or contexts. To enhance transferability, the included studies (II-IV) have presented detailed thick descriptions of the methods, participants, and settings (Lincoln & Guba, 1988). In consideration of the generic nature of collaboration and the theoretical underpinnings of this thesis, the results can be expected to be transferable to other higher education settings both nationally and internationally.

EDUCATIONAL IMPLICATIONS

This thesis adopted the theory of Zone of Proximal Development as presented by Vygotsky (1980) to understand nursing students' collaboration and the collaborative process. Although the theory is meant for understanding an individual's learning development with the support of 'more capable others', this thesis has shown that the theory can be adopted on a group level with support coming from reciprocal peers. Understanding the complexity of collaboration and the transition from educator-led collaboration to student interdependence supports the identification of scaffolding activities that can support the development of the collaborative aspects in CL and can foster collaborative skills and independence as one approaches the nursing profession. In conclusion, the collaboration between nursing students in CL responds to the following didactic questions and suggests the following educational recommendations:

- Why
  Collaborative skills cannot be taken for granted but need to be taught. Therefore, the purpose of collaboration must be designed and agreed upon by the faculty and made transparent for both educators and students as a common ground for the collaboration.

- What
  Collaboration cannot be seen as an informal process. Instead, collaboration needs to be formalized within an educational organization and contextualized to the nursing profession and to the required collaborative skills in the profession.

- How
  Collaboration does not happen by itself. Therefore, collaboration needs to be organized and supported by scaffolding activities such as preparations, introductions, and didactic activities in line with daily activities in the nursing profession to support its development.

- When
  Collaboration is not a static process. On the contrary, collaboration is a dynamic development process that requires the educators to gradually fade out in their support and to adjust the scaffolding activities in accordance with the students' development.

FUTURE RESEARCH

The studies included in the thesis primarily investigated collaboration between students early in their education and presented implications from this specific context. In order to obtain further knowledge and understanding of the collaboration process, the students' development should be followed over a longer period of time, preferably throughout their entire education. Such knowledge could add additional dimensions to the concept of collaboration and the need for further adaptations that have not emerged in the present thesis.

Furthermore, the educational implications recommended in this thesis should be implemented and tested in collaborative learning environments in both campus-based education as well as in clinical practice. Letting students and educators evaluate their experiences can help to determine the outcome of collaboration and can contribute with evidence for further development of CL and FPA in nurse education.

In this thesis the significance of the educator’s role early in students’ collaboration has been stressed, as well as the importance of eventually fading out and leaving responsibility to the students. The final suggestion for future research is to investigate the role of nurse educators in CL. Further research needs to explore educators’ strategies and their need of support as well as their readiness for CL. Knowledge of the kind could help to identify supportive measures for nurse educators so that the role can be developed in CL and thereby further support the nursing students.

POPULÄRVETENSKAPLIG SAMMANFATTNING

Förmågan att samarbeta är avgörande i hälso- och sjukvårdsprofessionerna för att en patientsäker vård ska kunna tillgodoses. Därav behöver sjuksköterskestudenter erbjudas möjlighet att träna samarbete under utbildningen för att förberedas inför den kommande professionens förväntningar. Modeller för kollaborativt lärande såsom peer learning, problembaserat lärande och peer assisted learning är pedagogiska modeller som har visat sig erbjuda studenter möjlighet att träna samarbete. Här lär studenterna med av och med varandra utan direkt inblandning av en lärare. Lärarens roll blir stödjande och studenterna förväntas vara aktiva i sitt eget lärande. Genom att ta del av varandras kunskap och genom att ge varandra återkoppling på prestation och genomförande har modellerna visat sig stödja studenters lärande och utveckling.

Det har dock framkommit att samarbete kan vara en utmaning i det kollaborativa lärandet. Tävling, negativ konkurrens, mobbing och uteslutning har beskrivits som negativ påverkan i samarbetet. För att kunna utveckla det kollaborativa lärandet behöver således samarbete mellan studenter förstås så att strategier kan identifieras som kan underlätta samarbetet. I tidigare studier genomförda om kollaborativt lärandet i sjuksköterskeutbildning är det framför allt lärandet i klinisk praktik som fokuserats. Få studier har undersökt samarbetet mellan studenter vid universitetsbaserade undervisningen. Denna avhandling bygger på studier som har undersökt hur sjuksköterskestudenter i första terminen i utbildningen samarbetar med varandra och hur samarbetsprocessen ser ut då studenterna gemensamt utför praktisk träning vid kliniskt träningscentrum. För att erbjuda ett sammantaget resultat speglar avhandlingen såväl studenter som lärares perspektiv från denna kontext. Då återkoppling mellan studenter är en viktig del av kollaborativt lärande presenterar avhandlingen vidare en kartläggning av den forskningslitteratur som beskriver studentåterkoppling, eller feedback mellan studenter utifrån flera aspekter i hälso- och sjukvårdsutbildningar.

Avhandlingens resultat visar att sjuksköterskestudenters samarbete utgörs av ett spänningsfält mellan att å ena sidan kunna anpassa sig till andra, till att vara sjuksköterskestudent och till ny kunskap, och å andra sidan till att inte vara följsam i samarbetet. Detta visar sig leda till ett tidskrävande, osynkroniserat samarbete med mindre reflektion mellan studenterna. Vidare visas att samarbete mellan studenter utgörs av en process som i denna avhandling har satts i ett utvecklingsteoretiskt sammanhang. Inledningsvis i denna process representeras samarbetet av en oro kopplat till grupptillhörighet samt en osäkerhet i de förväntningar och krav som ställs. Som en följd är behovet av lärarstöd stort i denna initiala fas för att samarbetet ska fungera. Succesivt utvecklas dock ett ömsesidigt beroende mellan studenterna då de identifierat att de behöver varandra för att klara de utmaningar de ställs inför. Utmaningarna representeras av komplexiteten i uppgifterna de har framför sig vilka inte kan klaras utan stöd från studentkollegorna. I samarbetsprocessens slutskede har en självständighet utvecklats hos studenterna. Här använder studenterna framför allt varandras kunskap. De har utvecklat sin förmåga att ge konstruktiv återkoppling till varandra och behovet av lärarens stöd har minskat. Studenternas fokus är mer kopplat till momenten som ska utföras än vem de utför det med vilket visar på ett närmande mot den professionella rollen som sjuksköterska.

För att minska tidigare beskrivna komplikationer i studenters samarbete och för att utveckla kollaborativt lärande bör syftet med samarbete tydliggöras av utbildningen. Syftet bör kopplas dels som ett stöd för lärandet, dels till samarbetets specifika betydelse i sjuksköterskeprofessionen. Således kan studenters förmåga att samarbeta inte tas förgivet då studenterna inte har tidigare kunskap och erfarenhet av denna roll. För att samarbetet ska förstås utifrån rollen som sjuksköterska bör stöd i utbildningen utgöras av introduktioner, instruktioner och förberedelser. Instruktionerna bör uppmana studenterna till att gemensamt planera upplägg, rollfördelning och hur återkoppling ska ges innan de agerar. Detta bör utföras för att dels erhålla ett flyt i arbetet, dels för att efterlikna den planering som sker med patienter, närstående och kollegor i det dagliga arbetet i sjuksköterskeprofessionen. Återkoppling mellan studenterna bör vidare struktureras utifrån vad studenterna ska observera i varandras utförande och vad de specifikt ska ge återkoppling kring och hur. Studentåterkopplingen bidrar till att förbereda den kommunikativa delen av samarbetet och strukturerna bidrar till att stödja studenternas självständighet i att utföra dem. Däremot bör lärare ta ansvar för gruppindelning så att studenterna utmanas i att träna med olika personer och inte bara personer lika dem själva. Då förbereds studenterna för det mångfacetterade samarbete de kommer att möta i professionen. Detta förhindrar även risken att någon student hamnar utanför. Ovan beskrivna stöd för samarbetet är framför allt av vikt att studenterna erhåller initialt i samarbetet och efterhand som samarbetet utvecklas bör lärarens stöd succesivt avta då studenterna kan ta ett allt större eget ansvar då de utvecklats till sin maximala utvecklingszon.

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Formative peer assessment in higher healthcare education programmes: a scoping review

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ABSTRACT

Objectives Formative peer assessment focuses on learning and development of the student learning process. This implies that students are taking responsibility for assessing the work of their peers by giving and receiving feedback to each other. The aim was to compile research about formative peer assessment presented in higher healthcare education, focusing on the rationale, the interventions, the experiences of students and teachers and the outcomes of formative assessment interventions.
Design A scoping review.
Data sources Searches were conducted until May 2019 in PubMed, Cumulative Index to Nursing and Allied Health Literature, Education Research Complete and Education Research Centre. Grey literature was searched in Library Search, Google Scholar and Science Direct.
Eligibility criteria Studies addressing formative peer assessment in higher education, focusing on medicine, nursing, midwifery, dentistry, physical or occupational therapy and radiology published in peer-reviewed articles or in grey literature.
Data extractions and synthesis Out of 1452 studies, 37 met the inclusion criteria and were critically appraised using relevant Critical Appraisal Skills Programme, Joanna Briggs Institute and Mixed Methods Appraisal Tool tools. The pertinent data were analysed using thematic analysis.
Result The critical appraisal resulted in 18 included studies with high and moderate quality. The rationale for using formative peer assessment relates to giving and receiving constructive feedback as a means to promote learning. The experience and outcome of formative peer assessment interventions from the perspective of students and teachers are presented within three themes: (1) organisation and structure of the formative peer assessment activities, (2) personal attributes and consequences for oneself and relationships and (3) experience and outcome of feedback and learning.
Conclusion Healthcare education must consider preparing and introducing students to collaborative learning, and thus develop well-designed learning activities aligned with the learning outcomes. Since peer collaboration seems to affect students' and teachers' experiences of formative peer assessment, empirical investigations exploring collaboration between students are of utmost importance.

Strengths and limitations of this study

- The current scoping review is previously presented in a published study protocol.
- Four databases were systematically searched to identify research on formative peer assessment.
- Critical appraisal tools were used to assess the quality of studies with quantitative, qualitative and mixed-methods designs.
- Articles appraised as high or moderate quality were included.
- Since only English studies were included, studies may have been missed that would otherwise have met the inclusion criteria.

BACKGROUND

Peer assessment is an educational approach where feedback, communication, reflection and collaboration between peers are key characteristics. In a peer assessment activity, students take responsibility for assessing the work of their peers by giving (and receiving) feedback on a specific subject.[1] It allows students to consider the learning outcomes for peers of similar status and to reflect on their own learning mirrored in a peer.[2] Peer assessment has shown to support students' development of judgement skills, critiquing abilities and self-awareness as well as their understanding of the assessment criteria used in a course.[1] In higher education, peer assessment has been a way to move from an individualistic and teacher-led approach to a more collaborative, student-centred approach to assessment[1] aligned with social constructivism principles.[3] In this social context of interaction and collaboration, students can expand their knowledge, identify their strengths and weaknesses, and develop personal and professional skills[4] by evaluating the professional competence of a peer.[5] Peer assessment can be used in academic and professional settings as a strategy to enhance students' engagement in their own learning.[6–8] The collaborative aspect of peer assessment relates to professional teamwork, as well as to broader goals of lifelong learning. As argued by Boud *et al*,[1] peer assessment addresses course-specific goals not readily developed otherwise. For healthcare professions, it enhances the ability to work in a team in a supportive and respectful atmosphere,[9] which is highly relevant for patient outcome and the reduction of errors compromising patient safety.[10] However, recent research has shown that peer collaboration is challenging[11] and that healthcare professionals are not prepared to deliver and receive feedback effectively.[12] This emphasises the importance for healthcare educators to support students with activities fostering these competences. Feedback is highly associated with enhancing student learning[13] and modifying learning during the learning process[14] as a means for students to close the gap between their present state of learning and their desired goal(s). Peer feedback can be written or oral and conducted as peer observations in small or large groups.[8] Further, it is driven by set assessment criteria,[1] which can be either summative or formative, formal or informal. Summative assessment evaluates students' success or failure after the learning process,[15] whereas formative assessment aims for improvement during the learning process.[4 16] According to Black and Wiliam,[15] formative peer assessment activities involve feedback to modify the teaching and learning of the students. The intention of feedback is to help students help each other when planning their learning.[4 17] An informal formative peer assessment activity involves a continuous process throughout a course or education, whereas a formal one is designated to a single point in a course momentum. Earlier research on peer assessment in healthcare education has provided an overview of specific areas within the peer assessment process. For example, Speyer *et al* presented psychometric characteristics of peer assessment instruments and questionnaires in medical education,[18] concluding that quite a few instruments exist; however, these intruments mainly focus on professional behaviour and they lack sufficient psychometric data. Tornwall[12] focused on how nursing students were prepared by academics to participate in peer assessment activities and highlighted the importance of creating a supporting learning environment. Lerchenfeldt *et al*[19] concluded that peer assessment supports medical students in developing professional behaviour and that peer feedback is a way to assess professionalism. Khan *et al*[20] reviewed the role of peer assessment in objective structured clinical examinations (OSCE), showing that peer assessment promotes learning but that students need training in how to provide feedback. In short, the existing literature contributes valuable knowledge about formative peer assessment in healthcare education targeting specific areas. However, there seems to be a lack of compiled research considering formative peer assessment in its entirety, including the context, rationale, experience and outcome of the formative peer assessment process. Therefore, this scoping review attempts to present an overview of formative peer assessment in healthcare education rather than specific areas within that process.

METHOD

This scoping review was conducted using the York methodology by Arksey and O'Malley[21] and the recommendations presented by Levac *et al*.[22] We constructed a scoping protocol, using a Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols, to present the planned methodology for the scoping review.[23]

Table 1 The Population Concept and Context mnemonic as recommended by the Joanna Briggs Institute

Population	Concept	Context
Students assessing students	Intervention, rationale, outcome, context and students' and teachers' experience of formative peer assessment	Healthcare education programmes in higher education

Aim and research questions

We aimed to compile research about formative peer assessment presented in higher healthcare education. The research questions were as follows: What are the rationales for using formative peer assessment in healthcare education? How are formative peer assessment interventions delivered in healthcare education and in what context? What experiences of formative peer assessment do students and teachers in healthcare education have? What are the outcomes of formative peer assessment interventions? We used the 'Population Concept and Context' elements recommended for scoping reviews to establish effective search criteria (table 1).[24]

Relevant studies identified

The literature search was conducted in the databases PubMed, Cumulative Index to Nursing and Allied Health Literature, Education Research Complete and Education Research Centre. Search tools such as Medical Subject Headings, Headings, Thesaurus and Boolean operators (AND/OR) helped expand and narrow the search. Initially, the search terms were broad (eg, peer assessment or higher education) in order to capture the range of published literature. However, the extensiveness of the material made it necessary to narrow the search terms and organise them in three major blocks. The following inclusion criteria were applied in the search: (1) articles addressing formative peer assessment in higher education; (2) students and teachers in medicine, nursing, midwifery, dentistry, physical or occupational therapy and radiology and (3) peer-reviewed articles, grey literature (books, discussion papers, posters, etc). Studies of summative peer assessment, instrument development and systematic reviews were excluded. We incorporated several similar terms related to peer assessment in the search to ensure that no studies were missed (online supplemental appendix 1). Furthermore, we consulted a well-versed librarian with experience of systematic search[25] to assist us in systematically identifying relevant databases and search terms for each database, control the relevance of the constructed search blocks and manage the data in a reference management system. No limitation was set for year, all studies indexed in the four databases were included until the last search 28 May 2019.

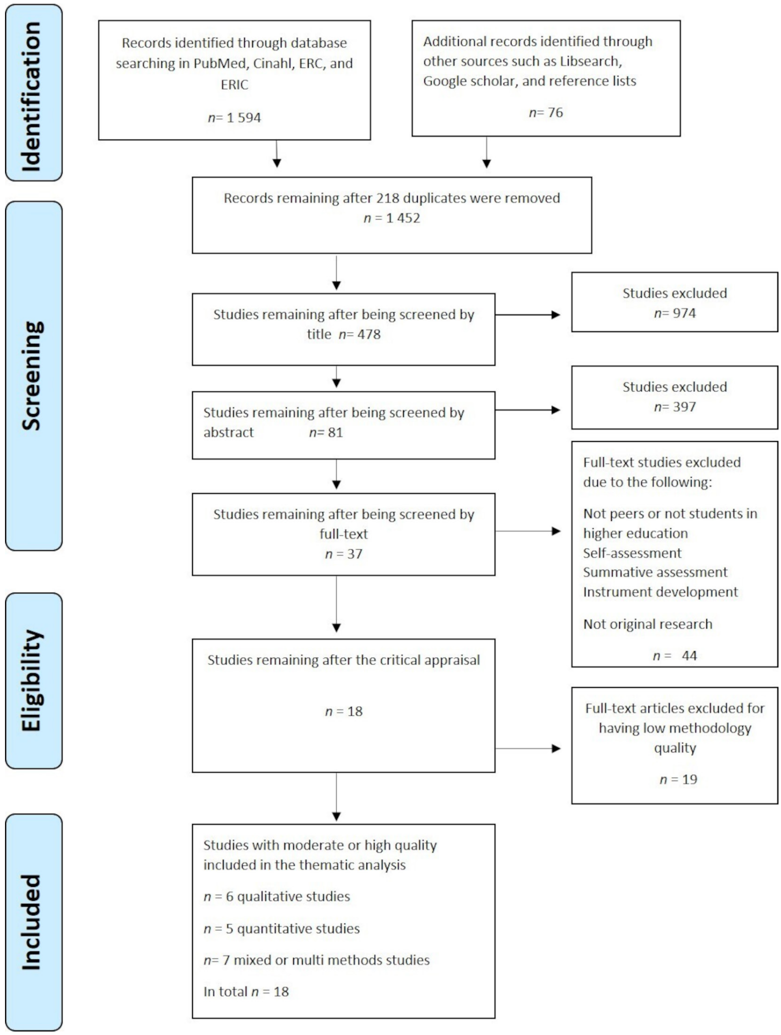

Figure 1 PRISMA flow chart. ERC, Education Research Centre; ERIC, Education Research Complete; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Study selection

The process of the study selection and the reasons for exclusion are presented in a flow diagram[26] (figure 1). First, the first author (MS) screened all 1452 titles. Second, MS read all the abstracts, gave those responding to the research questions a unique code, and organised them in a reference management system. The reason for inclusion and exclusion at title and abstract level was charted by the first author and critically discussed within the team (MS, EM, MB and EC). An additional hand search of reference lists was conducted. To cover a subject in full, a scoping review should include search in grey literature.[21 22] Therefore, the grey literature was scoped to find unpublished results by searching Google Scholar, LibSearch and Science Direct. The grey literature mostly contained research posters, conference abstracts, discussion papers and books, but a handsearch revealed original research articles that were added for further screening and appraisal. Finally, the first author (MS) arrived at 81 studies, read them in full-text, and discussed them with the other three authors (EM, MB and EC).

Charting the data

We constructed a charting form to facilitate the screening of the full-text studies (online supplemental appendix 2). Out of the 81 studies, 37 met the inclusion criteria and were appraised for quality using Critical Appraisal Skills Programme (CASP).[27] The reason for conducting a crtitical appraisal of the studies was to enhance the use of the findings for policy-making and practice in higher healthcare education.[28] To investigate the interpretation of the quality instruments, three members of the research team (MS, EM and EC) conducted an initial test assessment of two randomly selected studies and graded them with high, moderate or low quality. Additional screening tools were used for studies with a mixed methods design[29] and cross-sectional studies[30] not available in CASP. When a discrepancy arose, a fourth researcher (MB) assessed the articles independently without prior knowledge of what the others have concluded. This was followed by a discussion among all four researchers to secure internal agreement on how to further interpret the checklist items and the quality assessments. Consequently, to ensure high quality, the studies had to have a ''yes' answer for a majority of the questions. If 'no' dominated, the study was excluded. Since earlier reports[31] have raised and discussed the importance of ethical issues in systematic reviews, all screening protocols in this review included ethical considerations, as an individual criterion. The first author critically appraised all 37 articles, and 15 articles were divided between the team members (EM, MB and EC) and independently appraised. Nevertheless, during the screening process all 37 articles were critically discussed using the Rayyan system for systematic reviews[32] before final decision for inclusion. By this procedure, all authors agreed on not only which articles to include, but also the reason for exclusion. The critical appraisal resulted in 18 studies with high and moderate quality (table 2).

Collating, summarising and reporting results

The analysis process followed the five phases of thematic analysis described by Braun and Clarke,[33] with support of a practical guide provided by Maguire and Delahunt.[34] The first phase included familiarising with the data. Therefore, prior to the coding process, we read all the articles to grasp a first impression of the results presented within the included studies.We then conducted a theoretical thematic analysis, meaning that the results were deductively coded,[33] guided by the research questions. We read the results a second time before starting the initial coding. The codes consisted of short descriptions close to the original text. The codes were then combined into themes and subthemes. The themes were identified with a semantic approach, meaning that they were explicit: we did not look for anything beyond what was written.[33] Finally, we constructed a thematic map to present an overview of the results and how the themes related to each other. The results from the studies are presented narratively.

Consultation

Consultation is an optional stage in scoping reviews.[21] However, since it adds methodological rigour,[22] we presented and discussed the preliminary results and the thematic map with nine academic teachers who are experts within the field of healthcare education and pedagogy. The purpose of the consultation was to enhance the validity of the results of the scoping review and to facilitate appropriate dissemination of outputs.[33] The expert group responded to four questions: Do the themes make sense? Is too much data included in one single theme? Are the themes distinct or do they overlap? Are there themes within themes?[34] The consultation resulted in a revision of a few themes and the way they related to each other.

Patient and public involvement

No patients or members of the public were involved.

RESULTS

The 18 included studies were published between 2002 and 2017 in the USA (6), the UK (6), Australia (3), Canada (2) and the United Arab Emirate (1) (table 3). The studies were conducted in medical (12), dental (2), nursing (2), occupational therapy (1) and radiography (1) educations. Six studies were presented in the framework of an existing collaborative educational model.[35–40] Our review revealed that the most frequent setting for formative peer assessment activities is within clinical skill-training courses,[35 39–47] involving intraprofessional peers. The common rationale for using formative peer assessment is to support students, usually explained by the inherent learning of the feedback process,[35 39 40 43–45 47–51] and to prepare students for professional behaviour and provide them with the skills required in the healthcare professions.[36–38 46–49 52] Table 3 presents the results of the analysis related to the research questions of context, rationale and interventions of formative peer assessment.

The results related to the research questions about the experience of students and teachers and the outcome of formative peer assessment interventions fall within three themes: (1) the organisation and structure of peer assessment activities, (2) personal attributes and consequences for oneself and one's peer relationships and (3) the experience and outcome of feedback and learning.

The organisation and structure of formative peer assessment activities

In the reviewed studies, students express that the responsibility of faculty is a key component in formative peer assessment, meaning that faculty must clearly state the aim of the peer assessment activity. Students highlight the need to be prepared and trained in how to give and receive constructive feedback.[36 47 50–52] The learning

Table 2 Overview of included studies

Author, year, country, and journal	Aim	Design	Participants	Main findings	Quality*
Arnold, 2005[52] USA *Journal of General Internal Medicine*	Identify factors that encourage or discourage student participation in peer assessment	Qualitative Grounded theory Focus groups (16) at two medical schools	n=61, medical students in years 1, 3 and 4	The characteristics of the peer assessment system and the environment can encourage or discourage participation. Themes: (1) Students' struggle with peer assessment, (2) Characteristics of a peer assessment system, and (3) Environmental factors	Moderate
Cho, 2016[41] England *BMC Medical Education*	Investigate the effect of peer-group size on competency-based skills	Quantitative Cluster Randomised clinical trial	n=115, medical students in year 6	Smaller groups (4.1) show more active and preferred than large groups (8,1). Group size did not impact scores.	High
Chou, 2013[39] USA *Medical Education*	Examine the role of prior peer-learning relationships between students in their delivery and receipt of feedback on clinical communication skills	Mixed method Case–control Descriptive statistics Survey, video observations	n=72 medical students in year three with prior peer learning relationships n=36 students in control group with no prior peer relationships.	Students with prior peer learning relationships more likely to provide specific corrective feedback than those without prior relationships. No significant difference between groups regarding how feedback was received.	Moderate
Cushing, 2011[35] UK *Medical Teacher*	Investigate the benefits of formative peer feedback in communication skills and develop a training programme in peer feedback	Mixed method Questionnaire (20 items) at two occasions with 6 months in between. Focus groups (five medical- and two nurse students)	n=45 medical students in year 1 n=48 nursing students in year 1	Students valued the learning opportunity of both being examiner and observer. They preferred more in-depth feedback and feedback from tutors. They expressed anxiety about giving negative feedback to a peer and had mixed views on giving feedback (relaxed or pressured) and its use in clinical placements.	High
Elshami, 2017[50] United Arab Emirates *Radiography*	Assess perception of formative peer assessment	Qualitative Action research Focus groups (3) Content analysis	n=19 (24†) diagnostic radiography students in year 3	Formative peer assessment gives valuable feedback from same level or more experienced peers. Need for training and detailed rubrics.	Moderate
Emke, 2017[38] USA *Teaching and Learning in Medicine*	Demonstrate that perceptual errors related to professionalism behaviours can be detected early through repeated multisource feedback	Quantitative	n=246 medical students in year 2	Multiple peer assessments and feedback a tool predictor of unprofessional behaviour.	Moderate
Iqbal, 2016[36] Australia *BMC Medical Education*	Explore students' and tutors' perception of key collaborative behaviours that impact collaborative learning and interaction	Qualitative Focus groups (5) with students Interviews (8) with teachers Thematic analysis	n=22 medical students in year one and two n=8 teachers	Being respectful, giving constructive feedback, and being engaged and prepared had positive impact on both learning and group interaction. Passiveness, unreliability, irresponsibility, and condescending attitudes had a negative impact on learning and interaction. Similar results from teachers.	High

Continued

Table 2 Continued

Koh, 2010[51] UK *Nurse Education in Practice*	Explore how academic staff experience, understand and interpret the process of formative assessment and feedback of theoretical assessment	Qualitative Phenomenology Semi-structured interviews (22) Thematic analysis	n=20 academic staff in nurse education	Teachers see themselves as key facilitators and think students prefer teacher feedback. Students are assumed to have the skill to peer assess and give feedback but are unprepared and need support and introduction early in education. Teachers need professional development themselves.	Moderate
Mui Lim, 2010[49] Australia *International Journal of Therapy and Rehabilitation*	Improve students learning through interactive formative assessment and student generated questions	Mixed methods Cohort study Evaluation questionnaire	n=115 occupational therapy students in year 1 in 2009 compared with n=98 students in 2008	Significant improvement in exams result from being part of interactive formative assessment, which is beneficial for learning and identifying knowledge gaps.	Moderate
Martin, 2014[48] Canada *Nurse Education Today*	Examine collaborative testing versus traditional test taking with undergraduate nursing students in a nine-station OSCE	Mixed method Cross-over design Survey Focus groups	n=70 nursing students	Significantly higher scores in collaborative testing than in traditional testing. Themes: (1) studying more/studying differently, (2)/ cognitive collectivism (3), 'it stuck in my head better' (4), confidence, and (5) practicing how to share knowledge and negotiate.	Moderate
Moineau, 2011[42] Canada *Medical Education*	Compare scores and experiences of formative assessment from faculty and senior students during OSCE-examinations	Quantitative Cross sectional Prequestionnaire and postquestionnaire	n=66 medical students in year 2 n=27 year four student examiners n=27 teaching doctors	Students (year 4) assessing students (year 2) with checklists in OSCE-examinations equally assessed compared with faculty members. A positive learning experience expressed from both students and faculty.	Moderate
Nofziger, 2010[37] USA *Academic Medicine*	Investigate the impact of peer assessment on future professional development and students' experiences	Qualitative Questionnaire and narrative comments Frequency count	n=70 medical students in year 2 n=48 in year 4	67% found peer assessment helpful, reassuring, or confirming something they knew; 65% reported important transformations in awareness, attitudes, or behaviours because of peer assessment. Change was more likely when feedback was specific and described an area for improvement.	Moderate
Rees, 2002[46] UK *Medical Education*	Explore students' perceptions of communication skill assessment	Qualitative Focus groups	n=7 medical students in year 1 n=7 in year 2 n=10 in year 3 n=5 in year 4 n=3 in year 5	Year 4 and 5 more positive than younger students. Opportunities to compare communication skills with peers from same level. Learning experience being the assessor. No constructive criticism from peers. Difficult to be objective and to give feedback.	High
Satterthwaite, 2008[43] UK *European Journal of Dental Education*	Investigate if any differences existed between marks given by a peer group and those given by experienced assessors	Quantitative Cross sectional	n=65 dental students	No significant difference in grades between experienced examiners and peer group.	Moderate

Continued

Table 2 Continued

Spandorfer, 2014[47] USA *Anatomical Science Education*	Determine whether peer assessment improves students work habits and interpersonal attributes and whether it is accepted by students, focusing on low performing students	Multimethods Paired sample t-test Pearson correlation coefficients Survey-content analysis	n=267 medical students in year 1; follow-up in year 2	Significant improvement after on-line peer feedback between test 1 and 2. Themes: (1) Initiative, (2) Communication, (3) Respect, (4) Preparation, and (5) Focus. Students prefer anonymous feedback from peers.	Moderate
Tai, 2016[40] Australia *Advances in Health Science Education*	Investigate students' experience of peer-assisted learning.	Mixed methods Ethnographic Survey, observations, and interviews Thematic analysis	n=10 medical students in year 1 (observed) n=191 students in year 3 (survey)	Observing and giving feedback to peers contributed to learning, but students value feedback from teachers for validation. Students want to preserve social relationships with peers; therefore, feedback is not so constructive. Peers provide a supportive learning environment.	High
Tricio, 2016[45] UK *European Journal of Dental Education*	Analyse written feedback provided as a part of a formative and structured peer assessment protocol.	Multimethods Descriptive statistic Thematic analysis	n=40 dental students in year two in pre-clinical skills laboratory n=68 dental students in year 5 in clinic	Year 2 focuses on practical and clinical knowledge; in contrast, year 5 focuses comments on communication, management, and leadership. Year 2 gives more positive comments on peer performance than year 5.	Moderate
Vaughn, 2016[44] USA *The American Journal of Surgery*	Evaluate the use, quality, and quantity of peer video feedback and compare peers and faculty feedback.	Quantitative Cross-sectional Paired t-test, Mann-Whitney statistic Survey	n=24 medical students‡	Significant change in performance across three periods in both groups. Peer feedback group performed better at final assessment than faculty feedback group (not significant). Peers gave higher scores than faculty. No significant differences when using a checklist.	Moderate

*High equals majority of items in the critical appraisal tools.
†Twenty-four students included in the intervention, and 19 attended the focus group session.
‡Twelve students received faculty feedback, and 12 students received peer feedback.
OSCE, objective structured clinical examination.

activities need to be well designed and supported by guidelines on how to use them.[35 36 50 52] Otherwise, it could discourage students from participating in the peer activities.[52] Novice students find it difficult to be objective and to offer constructive criticism in a group.[36 46] This emphasises the importance of responsibility from faculty, especially when students are to give feedback on professional behaviour.[52] Some students prefer direct communication with peers when feedback is negative, whereas others think it is the responsibility of faculty.[52] There is some ambiguity regarding whether feedback should be given anonymously or not,[47 52] whether it should bear consequences from faculty or not,[52] whether it should be informal or formal, and whether the peer should be at the same academic level or at a more experienced higher-level.[50 52] Moreover, some students express how they favour small groups[41 49]; as students in small groups are more active than those in large groups.[41] Students and teachers agree that peer assessment should be strictly formative rather than summative.[42 46 52] Teachers see themselves as key facilitators and express that students value feedback from teachers rather than from peers (in terms of credibility).[51] Students express similar sentiments even if they appreciate the peer feedback.[40 42 44 46] However, teachers confirm the need for training and preparing students early in the education, as well as the need for their own professional development to guide students effectively.[51]

Personal attributes and the impact and consequences for oneself and one's peer relationships

Students generally focus on how peer assessment activities may affect their personal relationships in a negative

Table 3 Overview and summery of the context, rationale and interventions of formative peer assessment presented in the included studies.

Contexts	Rationales	Interventions
Intraprofessional students (17)*	Giving and receiving feeback supports student learning:	Introduction (in workshops):
Combination of medical and nursing students (1)	Promotes learning (8)	Preparations in giving and receiving feedback (3)
Conducted in the following:	Enhances critical thinking (1)	Introduction of guidelines or checklists to guide the peer assessor (3)
Clinical skill labs (11)	Promotes understanding of the assessment process (1)	Introduction of the learning activity (2)
Theoretical courses (7)	Develops critical and interpersonal skills (1)	Preparation in communication (1)
Combination of theoretical and clinical placement course (1)	Helps identify knowledge gaps (1)	Learning activities focusing feedback on professionalism:
Within an educational model as problem-based learning, peer learning or peer assisted learning (7)	Supports low-performance students (1)	Clinical skills (3)
	It prepares students for knowledge-related professionalism in the healthcare profession by helping them identify the following:	Collaborative behaviour (2)
	Professional and unprofessional behaviour (6)	Clinical reasoning (2)
	Clinical competence (2)	Theoretical knowledge (2)
	Technical skills (2)	Communication skills (2)
	Communication skills (2)	Management skills (1)
	Collaborative behaviour (2)	Feedback types:
	Evaluative judgement (1)	Face-to-face (7)
	It enhances teachers' teaching (1)	Anonymous (5)
	It provides cost benefits:	Written (3) or through observations (3)
	Students as assessors instead of teachers (2)	Interactive on-line assessment (3)
	Students as creators of the learning activities instead of teachers (1)	Grading of the given feedback (1)
		Random peers (8)
		Ability to choose peer (1)
		In small groups <6 (6)
		In large groups >6 (3)

*Appears in how many of the included 18 studies.

way.[35 37 42 50 52] They express worry over consequences for themselves and their social relationships[37 40 52] as well as feeling anxious that negative feedback given to a peer may affect the grading from faculty.[52] Moreover, students emphasise the importance of enthusiasm and engagement in listening to peers' opinions during their collaboration.[36 47] They mention positive personal attributes and behaviours such as being organised, polite and helpful as supportive for peer collaboration.[36 47] Further, they mention the importance of both a positive and close relationship between students and faculty[52] and a positive culture in the learning environment.[40] While students highlight the impact on and consequences for personal relationships, teachers speak of the importance of respect in formative peer assessment,[36] including respect for each other, the learning activity, and the collaboration and interaction.[36] Further, teachers emphasise the importance of students being self-aware, being well prepared and taking own responsibility for the peer assessment activity.[36]

The experience and outcome of feedback and learning

According to the students in the reviewed studies, formative peer assessment contributes to developing the skills needed in practice and in their future profession.[35 36 40 41 48 52] They appreciate the opportunity to give and receive feedback from a peer,[35 36 40 42 47 48 50] and they agree that the feedback they received made them change how they worked[42 48] or how they taught their peers.[47 48] They consider activities such as observation of others' performance as beneficial for learning because they make them reflect on their own performance[35 36 40 41 46 49 50] and help them identify knowledge gaps.[35 40 49] Students with prior experience of peer learning are more likely to provide specific guiding feedback than those without such experiences.[39] Moreover, two studies showed significantly improved test results for students who took part in a peer feedback activity compared with those who did not.[43 49] Further, students thought they could be honest in their feedback and would learn better if the feedback was more in-depth.[35 46] Students at entry level tend to give more positive feedback than senior students; they also focus on practical and clinical knowledge, whereas more senior students focus on communication, management and leadership in their feedback comments.[45] A study exploring what students remember of received feedback points to memories of positive growth, negative self-image and negative attitudes towards classmates. Received feedback sometimes confirmed personal traits the students already knew about.[37] In addition, negative feedback was more likely to result in a change in their work habits and interpersonal attributes.[37] Students expressed some anxiety regarding the usefulness of feedback from low-performing students[40 50] and non-motivated students, which contributes to ineffective interaction and learning.[36 47] Low performing students show lack of initiative, preparation and respect but also improvement in their grades after the peer assessment experience.[47] Furthermore, feedback from peers can be a predictor of a student's unprofessional behaviour; hence, it could be used as a tool for early remediation.[38] In an evaluation of faculty examiners' experience of students' feedback, the faculty express how they consider student feedback to be given in a professional and appropriate way and faculty examiners would have given similar feedback.[42] In an OSCE-examination where a checklist was used, the results showed statistical significance in assessment between faculty examiners and student examiners.[42]

DISCUSSION

We found that formative peer assessment is a process with two consecutive phases. The first phase concerns the understanding of the rationale and fundament of the peer assessment process for students and faculty members. The results indicate that the rationale is to support student learning and prepare them for healthcare professions. The formative peer assessment activities support students' reflection on their own knowledge and development when mirrored in a peer by alternating the roles of observer and observed.[53 54] It further contributes to skills as communication, transfer of understandable knowledge and collaboration, all significant core competences when caring for patients and their relatives.[54] For faculty, organising formative peer assessment, can be cost beneficial. This was recently emphasised in high volume classes expressing the reduction of costs with students giving feedback to a peer instead of teachers.[55] Nevertheless, students express the importance of clarifying the aim of the peer assessment activity and the responsibility of the faculty. We recommend faculty to clearly define the activity and explain how it supports student learning and professionalism, especially when students are to provide feedback to each other on sensitive matters, such as unprofessional behaviour. A collaborative activity between students requires trust, and the real intention must be made transparent.[4 56–58] Moreover, to enable student development in line with the learning outcomes, the learning activity needs to be well designed and understood by students.[59–61] However, Casey *et al*[62] recommended further investigations of how to prepare students for the peer assessment activities.

The second phase concerns the organisation and structure of the formative peer assessment activity, for example, how to give and receive feedback and the complexity of peer collaboration as it affects students' emotions concerning both themselves and their relationship with their peers. This coincides with earlier research emphasising the social factors of peer assessment and the importance for teachers to consider them.[4] Nevertheless, surprisingly, few studies highlight the collaborative part of peer assessment.[4 11] One reason might be that formative peer assessment is often presented as a 'stand alone' activity and not involved in a collaborative learning environment.[8 63] We agree with earlier research[64 65] arguing that peer assessment needs to be affiliated with practices of collaborative learning. Similar implications are presented by Tornwall,[12] who concluded the importance of integrating peer collaboration as a natural approach throughout education to support student development.

LIMITATIONS

Previous methodological concerns and discussions have been related to the systematic approach of handling grey literature.[66 67] We argue that the grey literature may contribute to a wider understanding of the research area. Nevertheless, when we conducted a critical appraisal of the included studies, the grey literature was excluded due to lack of methodological rigour. Therefore, we recommend considering this time-consuming phase of the methodology in scoping reviews. We further acknowledge that the last search was conducted in May 2019, studies may have been included if an additional search had been provided after this date and in other databases than the ones presented. Further, the current scoping review has not fully elucidated the perspective of teachers and faculty. Few of the included studies highlighted the teachers' perspective why further research is required.

CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH

Some have argued that research on peer assessment is deficient in referring to exactly what peer assessment aims to achieve.[68] We conclude that within healthcare education the aim of formative peer assessment is to prepare students for the collaborative aspects crucial within the healthcare professions. However, healthcare education must consider preparing and introducing students to collaborative learning; therefore, well-designed learning activities aligned with the learning outcomes need to be developed. Based on this scoping review, formative peer assessment needs to be implemented in a collaborative learning environment throughout the education to be effective. However, since peer collaboration seems to affect students' and teachers' experience of formative peer assessment, empirical investigations exploring the collaboration between students are of utmost importance.

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Appendix 1. Presentation of the search strategy and results from the Pub Med database until 28th of May, 2019.

	Search block 1: Healthcare education
#	MESH-terms
1	"Students, Medical"[Mesh] OR
2	"Students, Nursing"[Mesh] OR
3	"Students, Dental"[Mesh] OR
4	"Students, Health Occupations"[Mesh] OR
5	"Education, Medical"[Mesh] OR
6	"Education, Nursing"[Mesh] OR
7	"Education, Dental" [Mesh] OR
8	"Midwifery/education"[Mesh] OR
9	"Allied Health Personnel/education"[Mesh]
10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9
#	Free text terms
11	"medical student*" OR
12	"nursing student*" OR
13	"midwifery student* OR
14	"dental student*" OR
15	"physical therapy student*" OR
16	"occupational therapy student*" OR
17	"allied health student*" OR
18	"health occupations student*" OR
19	"health care stud*" OR
20	"Health care education" OR
21	"health science education" OR
22	"Medical education" OR
23	" Nursing education" OR
24	"Dental education" OR
25	"allied health education" OR
26	"Health occupation* education*" OR
27	"midwifery education"
28	S11 OR S12 OR S13 OR S14 ORS15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27
29	S10 OR S28

	Search block 2: Peer assessment
#	MESH
31	"Educational Measurement"[Mesh] OR
32	"Peer Group"[Mesh] OR
33	"Peer Review"[Mesh]
34	S31 OR S32 OR S33
#	Free text terms
35	"peer assessment" OR
36	"peer evaluation" OR
37	"peer observation" OR
38	"peer feedback" OR
39	"peer review" OR
40	"peer assess*" OR
41	"*peer assess" OR
42	"peer examiner" OR
43	"peer grad*" OR
44	"peer group" OR
45	"Student performance appraisal" OR
46	"educational measurement"
47	S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46
48	S34 OR S47

	Search block 3: Formative assessment
#	MESH
49	"Formative Feedback"[Mesh]
#	Free text terms
50	"Formative evaluation" OR
51	"Formative feedback" OR
52	“Formative assessment” OR
53	“Formative* assess*” OR
54	“Formativ* evaluation” OR
55	Formativ* OR
56	“formative evaluation research”
57	S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43
58	S49 OR S57

#	Combination of search blocks 1, 2, and 3
59	S29 AND S48 AND S58

Appendix 2. Charting form

CHARTING FORM

ARTICLE NO:

TITLE:

AUTHOR/S:

YEAR OF PUBLICATION:

COUNTRY:

RESEARCH DESIGN: QUANTITATIVE ☐ QUALITATIVE ☐ OTHER: ☐ ____________

METHOD:

AIM:

NUMBER OF PARTICIPANTS (n=):

SETTING:

MEDICAL EDUCATION ☐

NURSING EDUCATION ☐

MIDWIFERY EDUCATION ☐

PHYSIOTHERAPY EDUCATION ☐

OCCUPATIONAL THERAPY ☐

DENTAL EDUCATION ☐

OTHER ☐ ____________________

DOES THE STUDY PRESENT?

HOW PEER ASSESSEMENT INTERVENTIONS ARE DELIVERED	YES	NO	
PEER ASSESSMENT	YES	NO	
FORMATIVE ASSESSMENT	YES	NO	
STUDENTS EXPERIENCE	YES	NO	
TEACHERS EXPERIENCE	YES	NO	OTHER:
OUTCOME/S OF PEER ASSESSMENT INTERVENTION	YES	NO	
RATIONALE/S FOR PEER ASSESSMENT INTERVENTION	YES	NO	

MAIN FINDINGS:

INCLUDED: YES NO

REASON/S FOR EXCLUSION:

(Only to be answered if the study is to be included)

Grading according to the Critical Appraisal Skills Program (CASP)

QUALITATIVE STUDIES AND SYSTEMATIC REVIEWS

LOW ☐ MODERATE ☐ HIGH ☐

RCT AND CASE CONTROL STUDIES

LOW ☐ MODERATE ☐ HIGH ☐

COHORT STUDIES

LOW ☐ MODERATE ☐ HIGH ☐

Grading according to The Mixed Method Appraisal Tool

MIXED METHOD STUDIES

LOW ☐ MODERATE ☐ HIGH ☐

Grading according to the Joanna Briggs Institute Critical Appraisal Tool

QUASI-EXPERIMENTAL STUDIES

LOW ☐ MODERATE ☐ HIGH ☐

ANALYTICAL CROSS SECTIONAL STUDIES

LOW ☐ MODERATE ☐ HIGH ☐

CASE REPORTS

LOW ☐ MODERATE ☐ HIGH ☐

Reviewed by:

(Signature and date)

II

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Collaboration between first year undergraduate nursing students – A focused ethnographic study

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ABSTRACT

Aim: The aim was to explore collaboration between first year undergraduate nursing students in a three-year bachelor program during clinical skills lab practices.

Background: The ability to collaborate is important in the nursing profession to ensure patient safety. Thus, efforts supporting nursing students with learning activities emphasizing this ability is crucial in nurse education as a preparation for the requirements of the nursing profession. Collaborative learning models are described as ways that support the students' interaction during education. However, collaboration between students has shown to have challenges such as negative competition and confrontations. This stresses the need to explore the collaboration between students to find ways to support the interaction.

Design: The study was conducted with a focused ethnographic approach.

Method: Data were generated by participant observations during one semester, involving 70 h observation of 87 first year nursing students for 6 months and 24 training sessions in clinical skills lab practices. Two focus group discussions were used to elaborate students' views of collaboration and to provide an opportunity for follow up questions and interpretations from the observations. Field notes and focus group discussions were interpreted as one unit of analysis conducted with thematic network analysis. A global theme were synthesized from organizational and additional basic themes presenting the overall metaphor of the students' collaboration.

Result: The global theme, *Between adaptation and non-conformity*, revealed a field of tension in the nursing students' collaboration. One the one hand, the global theme involved the students' ability to adopt to new knowledge and to being a nursing student in a clinical skills lab and to others' perspective. On the other hand, non-conformity creates a collaboration with less reflection between the students and non-synchronized and time-consuming laboratory work.

Conclusion: Collaborative activities in nurse education fosters and challenges nursing students' collaboration required for clinical practices and later in the nursing profession. By the presented scaffolding efforts, nurse educators can arrange a learning environment that can support the collaboration between students and facilitate the transition into the profession.

1. Introduction

Collaborative learning activities embedded in the curriculum in nurse education programs have been highlighted as important to develop and prepare undergraduate nursing student for the crucial collaborative requirements they will face in the healthcare profession (Jeppesen et al., 2017; Morley and Cashell, 2017; Sandahl, 2009; Yang et al., 2012). Collaborative skills are of utmost importance for patient care and healthcare profession and practice requires the ability to work collaboratively in a team (Cronenwett et al., 2007; Emich, 2018; Sims et al., 2015). In this study, we define collaboration in nursing as:

> an intra-professional or inter-professional process by which nurses come together and form a team to solve a patient care or healthcare system problem with members of the team respectfully sharing knowledge and resources (Emich, 2018, p.569).

However, different goals and expectations within a team have shown to generate collaborative conflicts with consequences highly associated

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with patient safety (Brandt et al., 2014; Morley and Cashell, 2017; Reeves et al., 2013). In recent years, collaborative learning has been presented in nurse education programs foremost, focusing on supporting the student learning process (Mamhidir et al., 2014; Pålsson et al., 2017; Stenberg and Carlson, 2015). More so, a recent review concluded that the efforts of introducing collaborative learning activities, for example formative peer assessment, prepares students for the crucial collaboration in the healthcare professions (Stenberg et al., 2021). However, the review emphasizes how collaboration between students can affect their personal relationships in a negative way, stressing the need for further understanding of the collaboration between students (Stenberg et al., 2021). This knowledge could provide valuable implications for educators to consider in future collaborative learning activities.

2. Background

Collaborative learning includes a variety of educational models, for example, problem-based learning, peer learning and peer assisted learning and originates from constructivism and socio-culture learning theories presented by Vygotsky (1962). Socio-culture learning theory emphasizes learning as constructed, meaning students are active participants building new knowledge on the foundation of previous learning and the learning occurs in a socio-cultural context (Vygotsky., 1980). Vygotsky (1980) argues that learning occurs within the student's Zone of Proximal Development. The Zone of Proximal Development describes learning as the distance between what a student can accomplish individually and with the support of more capable others represented by a teacher, a preceptor, or another student (Vygotsky, 1980). Boud et al. (2014) mean that in collaborative learning, students solve problems together, teach each other and reflect with one another. In collaborative learning, the role of the teacher, preceptor, or peer will be to facilitate the learning process (Boud et al., 2014), described by Vygotsky (1980) as scaffolding. Scaffolding represents the support a student needs to master a task otherwise out of reach (Vygotsky, 1980). In collaborative learning, this could be represented by structured learning activities clarifying the connection between theoretical and practical dimensions of nursing care to support student development (Sevenhuysen et al., 2013; Stenberg et al., 2020). It provides clear guidance of what subject to focus, the expectations of the students and role of the observing student, as well as a structure of the reflective process by facilitating questions for constructive feedback between the students (Stenberg et al., 2021). Collaborative learning reports to contribute to personal and professional development of undergraduate nursing students (Abdullah and Chan, 2018; Markowski et al., 2021), enhance technical skills and theoretical knowledge (Zhang and Cui, 2018), communications skills (Baghcheghi et al., 2011) and support self-confidence, collaboration- and leadership abilities (Stenberg and Carlson, 2015, Zhang and Cui, 2018). However, even though collaborative learning models describe situations where interaction among students are expected to occur, there are no guarantees that this will be the case (Dillenbourg., 1999). Recent studies have reported challenges in student collaboration, stressing the need to explore the collaboration between students (Le et al., 2018; Stenberg et al., 2021). These challenges have been described as hierarchical structures, disrespect, confrontations (Aase et al., 2014), non-compatible students or competitive relationships between students (Nygren and Carlson, 2017; Ravanipour et al., 2015; Stenberg and Carlson, 2015) and, anxiety that the peer collaboration may affect social relationships in a negative way (Stenberg et al., 2021). Le et al. (2018) stresses that the obstacles for collaboration can be explained by higher education, focusing on individual learning rather than collaborative learning, with the consequence that the social interaction between students is neglected. The importance of understanding social interaction and collaboration between students has previously been highlighted along with the concerns of developing ways to increase the probability of interactions (Berger et al., 2019; Emich, 2018; Zhang and Cui, 2018). However, this must start with defining the phenomenon of the collaboration where it actually appears – in the interaction between students. Collaborative learning activities have primarily been presented in medical education but are scarce in nursing education (Stenberg et al., 2021). Therefore, we argue that this understanding is of importance for further development of collaborative learning in nurse education programs to support and prepare nursing students for the crucial collaboration in the profession. Therefore, the aim of the present study was to explore the collaboration between undergraduate nursing students during clinical skills lab practices.

3. Method

To gain an in-depth understanding of the collaboration between the nursing students we used an ethnographic approach suitable when exploring processes, behaviors, methods and perceptions that occur within a group in a specific socio-cultural context (Hammersley and Atkinson, 2007). More specifically, we used a focused ethnographic design since the study was conducted in a smaller community during a short but intensive period over one semester with the observer (MS) possessing previous knowledge of the context (Knoblauch, 2005). The research fieldwork comprised participant observations to answer the research question: How do nursing students collaborate with each other during clinical skills lab practices? Focus groups interviews were performed to gain a deeper understanding and confirmation of findings (Hammersley and Atkinson, 2007). The analysis of data involved interpretation of meanings, communications, actions, body language and consequences of activities according to an ethnographic approach (Hammersley and Atkinson, 2007).

3.1. Setting

The observations were conducted in a skills lab at a university in southern Sweden during the first year in a three-year Bachelor of Nursing programme. The reason for conducting the observations in a skills lab was that the environment provides practice of collaboration between students (Jeppesen et al., 2017). In the first semester, nursing students practice technical skills in a specially equipped skills lab before entering clinical practice in their second semester. The activities include 1/basic hygiene routines 2/feeding 3/vital signs 4/venous blood sampling 5/injections 6/intravenous cannulation and, 7/catheterization of the urine bladder. Each session is preceded by a lecture and a demonstration by a teacher. Additionally, educational films presenting each skill procedure are available for the nursing students on a learning platform. The students are then divided into groups and remains in the same group throughout the semester. The practices in the skills lab are facilitated by a written case explaining the patient's situation and symptoms. Thereafter, the students are expected to practice the skills and provide feedback to each other. The students take alternate roles as nurse and observer. During some practices, mannequins are used instead of 'patients. Attending the skill practice is mandatory and ends with an Objective Structured Clinical Examination (OSCE) at the end of the semester. Passing the examination is required for attending the clinical practice the following semester.

3.2. Participants

The course, nursing and preclinical skills, involved 140 first year undergraduate nursing students divided into 16 groups. They were verbally informed of the purpose of the study by the first author (MS) and through written information at a learning platform. Of the students, 108 expressed their willingness to participate. Consent was required from all students in a group to be included. Thus, 87 nursing students were included, divided into eleven groups. The purpose of the study and the role of the observer was repeated by the first author (MS) when attending the first observation in each group. We did not collect demographic data since students' background was not connected to the aim of the study and we did not intend to contrast the result to explicit background variables.

3.3. Data collection

A pilot observation by the first author (MS) initiated the fieldwork, by getting a first impression of the environment and on how to write field notes. The pilot observation provided valuable understanding of when to observe, when to write and when to focus on details. In addition, it gave an insight on where to be in the room without disturbing the students, while at the same time be able to observe and capture the conversations. The observations were conducted by the first author (MS) taking the strict role as an observer without conversations or active interactions with neither the nursing students, nor the lecturers. The fieldwork was performed during 70 h of observation at 24 different occasions during one semester between January and May 2020. The observations were documented by descriptive field notes taken during the observations as part of the data collection and analysis. The data collection and the initial analysis took place simultaneously, following an ethnographic approach (Hammersley and Atkinson, 2007). To avoid the risk of memory bias, the field notes were transcribed immediately after the observations. To ensure dependability, additional reflections about the observer's role were written after each session and discussed within the research team. When the course was completed, students were invited through e-mail and the learning platform to participate in a focus group interview. Two focus group interviews were conducted with altogether six of the observed students. The focus group gave an opportunity to ask follow up questions of what have been observed during the field studies, allowing for elaboration of students' views and experiences (Denzin and Lincoln, 2008) and to check the interpretations from the observations. Due to the corona virus pandemic, the interviews were conducted through a secure digital platform (Zoom) without video recording and were recorded on a Dictaphone for verbatim analysis. The first discussion lasted for 1 h and 10 min and the second for 1 h and 20 min. A guide as presented by Krueger and Casey (2002) was used in the interviews and an observer (RR) was present. The students in both groups were asked to talk about their thoughts of the collaboration between each other during the activities in the skills lab. Probing questions as: Can you tell me more…What do you mean by…? Can you further develop… were used for deepening the understanding of what was asked and to help students elaborate their thoughts.

3.4. Data analysis

The analysis of field notes and interviews was conducted as a thematic analysis organized according to thematic network as presented by Attride-Stirling (2001). Thematic network analysis aims to understand social phenomena and dynamics and presents a visual representation of the data with findings presented as starting from basic themes to organizational themes and finally summarized as a global theme (Attride-Stirling, 2001). In the unit of analysis, field notes from the observations and data from the focus group interviews were interpreted to seek for relationships in the whole data material. To ensure credibility, the written field notes and the transcript from the focus group interviews were read and discussed by the entire research team. Segments from the transcribed field notes and focus group discussions were reduced to codes independently by the first (MS) and last author (EC). Saturation was considered when no further codes could be identified. The list of codes was then abstracted and similar themes were refined and organized into basic themes representing the lowest order premises from the text. The basic themes captured a broad set of ideas. They were explained and clarified from the original data to confirm that they were representative and non-repetitive. The basic themes were brought together into similar, coherent organizing themes summarizing more abstract principles (Table 1). Finally, the organizing themes were rearranged into a global theme summarizing the principal metaphor in the text (Attride-Stirling, 2001).

To verify credible interpretation or inconsistencies, the transcribed text was read again through the lens of the basic, organizational and global themes and were discussed throughout the analysis process in the research team. These discussions also allowed for addressing reflexivity (Hammersley and Atkinson, 2007) based on the first authors earlier experiences of being a teacher in skills lab and the interaction between the researcher and the students. The result was presented with quotes using fictional names from the focus groups discussions and segments from the field notes.

4. Ethical considerations

Written informed consent was obtained from the nursing students in accordance with the World Medical Association (2013). Permission to carry out the study was given by the Head of Department. The students were informed in writing and orally, the purpose, the method and publication of the study, that participation was voluntary and that they could withdraw from the study at any time without affecting their studies. Furthermore, the students were informed that the members of the research team would not be involved as lecturers in the course. In a separate meeting, the lecturers involved during the skills lab training sessions were verbally informed of the purpose of the study and the role of the observer, stressing on the fact that the observations only focused the students' interactions. None of the authors were teaching or assessing and grading the students during the time of the study. All names in the quotes are fictional to protect student confidentiality. Ethical approval was obtained by the Ethical Review Agency Sweden (Dnr 2019-04474).

5. Findings

Exploring the collaboration between the undergraduate nursing students during skills lab practices exposed a field of tension, presented in each theme (Fig. 1). The two basic themes: *Negotiate or decide*; and *Prepared or unprepared* identified the organizational theme *Rhythm and disharmony*. The basic themes *Informed or misinformed* and *Support or undermine* identified the organizational theme *Trust and mistrust*. The two organizational themes contributed to the all-encompassing global theme *Between adaptation and non-conformity* representing the overall metaphor of the field of tension when the nursing students are collaborating.

6. Basic themes: negotiate or decide and prepared or unprepared

6.1. Negotiate or decide

Students verbalize their thoughts and reflections and thus, peers confirm or provide additional perspectives that seem to facilitate proceeding in actions. Instead of turning to the present teacher, they discuss and negotiate with each other to find solutions. Feedback occurs as a natural element in the communication:

> I think we understood that the purpose of reflections was to provide further development, not for pointing a finger at each other, but more as reflecting together. It was more as, we missed this, or, this is what we have to do, this is very important and so on. (Focus group 2, Student 4).

The decisions are shared between the students and they value and listen to others' opinion before taking a decision. On the other hand, in some groups, self-appointed leaders take charge and decide without confirmations from their peers with the consequences of disoriented students, misinterpretation and misunderstandings:

Table 1
Examples from the analysis of the field notes and the focus group discussions.

Codes	Themes	Basic themes (evident in the text)	Organizational themes (the abstract principles)	Global theme (the principle metaphor)
Reasoning Discussing Shared decision making Sharing and setting mutual goals Planning performance in advance Recapture together Synchronizing performances Involvement Division of labor discussed	1. Communication providing shared decisions, plans, goals and division of labor 2. Discussions and involvement for a synchronized performance	Negotiate or decide	Rhythm and disharmony	Between adaptation and non-conformity
Self-appointed leaders Telling others Going solo No role distribution No discussions Different goals Different priorities Unsynchronized performances	3. Taking own decisions and deciding for others without prior discussions 4. Different goals, priorities and lack of role distribution creates an unsynchronized performance			
To discuss demands to be prepared To give constructive feedback demands to have knowledge in advance Prepare in advance for alleviate nervousness Preparing important for having control Needs to be prepared when being observed by peers and receiving feedback.	5. Preparations important to be able to discuss and give feedback 6. Preparations for feelings of having control of the situation	Prepared or unprepared		
No learning opportunity or discussion if not prepared in advance Cannot give feedback to peer if not prepared Those unprepared are seen as free riders Prepared for the skills but not educated in how to give or receive feedback	7. Being unprepared hinders discussions, feedback and learning 8. Unprepared for giving and receiving feedback			
Invite others for collaboration Openness and shared feelings Being chosen as a peer Being responded to Receiving honest feedback Receiving constructive feedback Using a friendly tone Creating a safe room Making physical space for everyone Body language being consistent with what is verbal expressed Honesty Support by sharing knowledge Complete was has been agreed upon Providing feedback in a positive way Non-verbal encouragement Small groups Having fun	9. Support is created by being incorporated in the collaboration and by inviting others 10. Non-verbal gestures important to create feelings of safety. 11. Feedback needs to be honest, constructive and given in a positive way.	Support or undermine	Trust and mistrust	
Not being chosen as a peer Not receiving any response Language barriers The attitude of superior others Feelings of insecurity Lack of professional experience gives a feeling of being at a disadvantage and is stressful. Neutral body language Being left out in the social conversations Blaming others when failing Taking up all the space in the room	12. Being excluded by not being chosen as a peer or responded to undermining the collaboration. 13. Lack of professional experiences, neutral body language and language barriers undermining collaboration.			
Providing evident information to peer Being in time and physical present Open about lack of knowledge or information Ask others for information Informed of how to use the artefacts in healthcare Informed of the medical language	14. Providing evident information and use others for further information 15. Informed of artefacts and the medical language	Informed or misinformed		
Providing incorrect information Guessing Relying on previous non-evident knowledge from healthcare Seeks no information from others Repeat incorrect facts even when being corrected.	16. Providing and repeating non-evident or incorrect information 17. Not using others for information.			

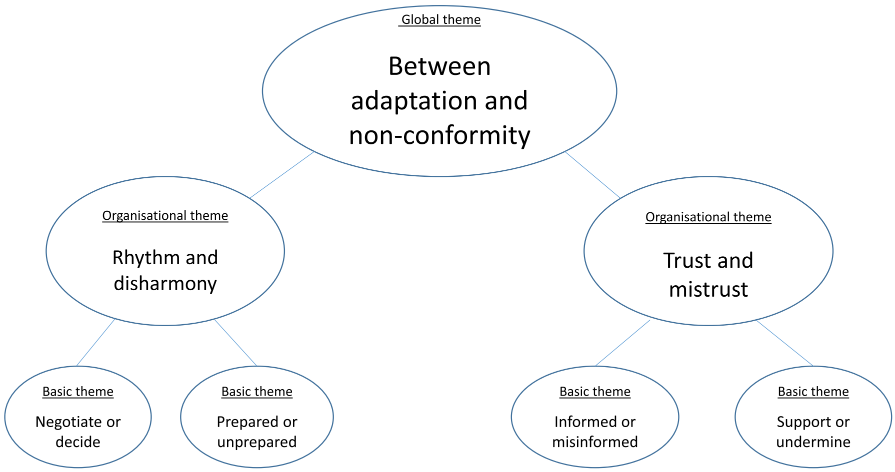

Fig. 1. Thematic network visualizing the collaboration between first year undergraduate nursing students.

> Laura and Joan will provide personnel hygiene to a "patient" (a third student). Without discussion, Joan goes to pick up a clean shirt and sheet. Laura gently asks if they it is not better to wash the patient first. Joan answers with a determinant voice: -"No, we change the shirt and sheet first". Laura looks insecure: - "But if we spill water maybe…" The rest of the practice continues with Joan taking the decisions and Laura trying to reason and ending up in mistakes that makes them having to start over again. (Field note, February 2020).

6.2. *Prepared or unprepared*

Some students seem well prepared for the skills training. They refer to the literature of the course and the instruction films and the acquisition of knowledge allows them to provide constructive feedback. The conversations merely focus on the present activity and offer additional knowledge. Furthermore, being prepared helped the students to control the situation and to decrease their sense of nervousness when performing with other students:

> I would have been very nervous in the skill lab sessions if I had not been well prepared. You are nervous about doing mistakes in front of the others in your group and that they shall judge you. (FG1 S1).

6.3. *Organizational theme: rhythm and disharmony*

Conversely, being unprepared hinders the students to take part in the discussions. They are silent and the body language becomes minimal or neutral, which seems to be perceived or misinterpreted as being uncommitted.

Through communication and by altering between listening and speaking, nursing students construct a rhythm in their collaborative performances. They structure and organize the activities between each other until reaching a shared decision so that everyone knows how to proceed with their actions. The role distribution is clarified between the students and therefore, they perform the activity towards a set common goal facilitating a flow and synchronization in the performances. However, requires the students to be prepared for the task. Rhythm is further created by a coherence between what is verbally expressed and the non-verbal expressions. On the other hand, when there is a lack of rhythm the students have to recap before being able to proceed with their actions. It is time consuming and creates disharmony, especially when the students approach a task in different ways without first consulting each other:

> Sarah and Anna focus on the task and pays no attention to what happens in the rest of the room (it is noisy and a lot of movement). They quietly discuss before they decide how to proceed. Together they go to pick out the material. Their attention are on the material and on each other. They place the material in order on a trolley. They go through the procedure before starting to perform the activity. The group next to them are loudly laughing, joking, talking about private matters and occasionally goes to check their cell phones. They seem unsure of what to do and are frequently asking the teacher. The material is in a mess on the trolley and a lot of material is missing. When Sarah and Anna has finish the activity, the others still have a lot left to do. (Field note, March 2020).

7. Basic themes: support or undermine and informed or misinformed

7.1. *Support or undermine*

A supportive atmosphere seems to be a fundamental factor for feedback. The students support each other by giving tips and hints. Being included in conversations, someone asking for your opinion, sharing private matters and laughing together, seem to contribute to camaraderie. The peers are open to each other about feelings and insecurity:

> Thanks to us being so close, we have been able to support each other. I have been able to give feedback to my peers without being seen as mean. We have expressed the feedback in a nice way with the attention to support each other and then we have talked about it afterwards. If we had not been that close, you would have been more careful with your comments. (FG2 S4).

Communication between students concern both the verbal and non-verbal language. The non-verbal language is inclusive by students seeking eye contact, making physical space for everyone in the room and expressing support by a simple nod or a smile. In pressed or nervous situations, they try to calm each other by using non-verbal signals as a hand on the shoulder or thumbs up sending supportive messages. However, small gestures or words can easily undermine the effect:

> Catherine, who has previous experiences as an assistant nurse, is working with Michelle. Catherine is acting as a patient when Michelle practices blood sampling for the first time (from a dummy attached to Catherine's arm). Michelle succeeds at the first attempt. She smiles and exhales in relief. Catherine looks disappointed, snorts and say in a harsh tone. – Do not think it is that easy in reality. (Field note, March 2020).

Occasionally, the students are told to independently choose a peer instead of the teacher, when organizing their groups. Students being left out from collaboration receive no opinions and feedback from others and have no one to turn to when not knowing how to proceed. They eventually become silent in the conversations and insecure affecting their performance. In the same way, language barriers seem to undermine the collaboration as expressed by a student:

> I suddenly became very lonely. It felt…what is this? Is it the distance, is it where we live that matters, or is it my language that matters? I am aware that language can be a barrier to get close to others. (FG2 S6).

7.2. Informed or misinformed

Students with previous experiences in health care express their knowledge by telling stories and using expressions not familiar to those without previous experiences from healthcare. They are perceived as 'superior to others' and as owners of important information from 'the real world'. For others, this creates feelings of unequal conditions and disadvantages, which negatively influence the collaboration. However, when seemingly experienced students are proved to be misinformed or when they are contradicted, the peer eventually seems to turn to someone else's proven knowledgeable for confirmation:

> During a group discussion Mark and Lisa starts to argue about the correct way to handle a situation with a patient. Lisa is persistent in her argumentation and tries to convince the others in the group by expressing her experience of being in the situation for several times. The teacher joins them and supports the arguments from Mark. From that on the others in the group seems to listen more to what Mark has to say and less on Lisa. (Field notes, February 2020).

7.3. Organizational theme: trust and mistrust

Trust is created by a genuine presence, both physically and mentally. This includes attending the lessons, arriving on time, focusing on the subject at hand, proceeding and finishing what has been agreed up on between the peers. The students seem to gain trust from others by expressing evident knowledge, constructive feedback and being honest and open when knowledge is lacking:

> John appears stressed and is struggling with the correct order when conducting the catheterization of the urine bladder. Caroline helps him by asking him to take a deep breath and think the moment through before proceeding. When he has finished, she provides him with some advice about what he should think about the next time he is about to perform a catheterization. From that moment on, he starts to observe how Caroline is taking on a mission and turns to her when he needs help. (Field notes, May 2020).

On the other hand, students that provide feedback such as 'you were great, well done', when it was obviously not the case, seems to be perceived as not being reliable and honest, eventually leading to mistrust.

8. Global theme: between adaptation and non-conformity

The theme involves students' ability to adapt to being a nursing student in a clinical skills lab. Students with previous knowledge in healthcare adapt to the fact that their knowledge is limited and not always evident and thereby seem to accept new knowledge. However, some students persistently adhere to what they already think they know, argue and try to convince others, (even the teachers) and find it difficult to accept others' perspectives. Furthermore, some students have difficulties conforming the 'personal me' into a collaborative context in knowing when to speak and when to listen, when joking is appropriate or not, when letting others perform by taking a step back and by seeing those alone and in need of support. When students have the freedom to choose whom to collaborate with, the group ends up being homogeneous. Those ending up alone eventually seem to accept the situation of being left out and stop trying to become a part of the collaboration:

> Personally, I do not think it takes very much to connect to each other. However,when you have tried to give, give and receive nothing in return, then you stop trying. (FG1, S2).

9. Discussion

The result exposed a field of tension between adaptation and non-conformity that may contribute to further understanding of challenges in student collaboration presented in previous studies (Nygren and Carlson, 2017; Ravanipour et al., 2015; Stenberg et al., 2021), such as competitive relationships, anxiety and non-compatible students. The global theme in the current study reveals the importance of adaptation in the collaborative situations. This allows for natural feedback, discussion and shared decision-making between the students through communication. Communication interacts as an important element and as the key determinant of the collaboration (Souza et al., 2016). Additionally, the adaptation in the communication makes the students reach a common goal, which, in its extension, creates and time efficient way in the collaboration and rhythm in their performances. Adaptation is recognized as essential for teamwork in the healthcare profession, where shared decision-making and goals must be discussed in respect and with acceptance of others opinion (Souza et al., 2016). However, some students have difficulties finding mutual goals, sharing decisions and providing supportive feedback to each other, providing a non-conformity in the collaboration. Beran et al. (2014) emphasize adaptation as important for learning, but also highlight the consequences when the accuracy of a group's opinion or poor skills are not challenged. Therefore, we recommend educators to consider introducing scaffolding efforts and include instructions requiring the students to plan, structure and agree on role division of the performance before taking action in the peer activity (Wosinski et al., 2018). This may support students' collaboration with each other and their development associated to the crucial interdependence in healthcare when planning interventions for and with patients and related parties, as a team. However, positive interdependence can only be achieved when each group members' goals is understandable (Vygotsky, 1980). Furthermore, nurse educators could support students by including formative peer assessment as a required scaffolding activity in collaborative learning (Boud et al., 2014), especially to support the collaboration (Han and Ellis, 2021; Stenberg et al., 2021). Providing and receiving constructive feedback to each other when being observed or being the observer has recently been presented as important due to students mirroring their knowledge and development in others (Carlson et al., 2017; Homberg et al., 2019). Not least for the argument that the aim of formative peer assessment in healthcare education is to prepare students for the collaborative requirements within the profession (Stenberg et al., 2021). However, students favor to work together with homogeneous others when they have the possibility to choose with whom to collaborate. Therefore, to facilitate the development of collaborative abilities, we recommend nurse educators to challenge students by organizing them in predetermined groups, to avoid groups based on friendship and mirrored in homogeneous personalities. This may support students with further perspectives and prepare them for the multi-faced interactions they will meet in the nursing profession and in clinical practices (Morley and Cashell, 2017). Furthermore, it may prevent the potential risk of some students being left out in the collaboration as exposed in the basic theme, support and undermine. Lawson (2004) warns that in the development of collaboration, there is a risk of exclusion. The consequence may be that a student not involved, not chosen, responded to, or not self-engaged in the collaboration, can promote negative emotions that may led to early redemption from education (Perander et al., 2020). Additionally, our study reveals the importance of support. Equal findings are presented by Levett-Jones and Lathlean (2008) and Liljedahl et al. (2015), illuminating belongingness as a prerequisite for students' learning, motivation and engagement in the clinical practice environment. We acknowledge support within the same sphere as belongingness when it comes to students' collaboration in the skills lab setting. We argue that nurse educators could facilitate the collaboration between nursing students by the above presented scaffolding efforts and thereby contribute to, not only a structure for the collaboration between nursing students, but also a supportive learning environment. For example, Beran et al. (2014) suggested that a supportive environment allows students to present different opinions without the consequence of just adapting to the majority, or the 'strongest' voice in the group. We believe that these efforts can enhance the socialization into the profession, improve the transition into practice (Ruth-Sahd, 2011), challenge students' development of their interactions with others and thus develop in their Zone of Proximal Development (Vygotsky, 1980) in a supportive learning environment.

10. Limitations

The observations have been limited to a single setting due to the corona virus pandemic. Observations of collaboration between students in other settings may have provided a deeper understanding and representativeness of the findings. However, an ethnographic design generally favors a small-scale study to facilitate in-depth exploration of the social interactions between humans and there was a large number of cases observed that provides a basis for generalization (Hammersley and Atkinson, 2007). We acknowledge the small sample for the focus groups that we tried to increase through sending out reminders. However, since it was not possible for conversations and interactions with the students during the sessions in the skills lab, the focus group interviews provided this and additional understanding to the extensive field notes. Further, the pandemic made it impossible to meet the students face-to-face in the focus group discussions and were thereby conducted during a secured digital platform. This may have affected participation. Moreover, we acknowledge the risk of dependency in the focus group interviews associated with the first author being a lecturer at the nursing programme. However, the participating students seemed comfortable and vividly shared their opinion and experiences. The present observer (RR) at the interviews also confirmed this.

11. Conclusion

This study presents scaffolding efforts that can challenge students' Zone of Proximal Development and thereby contribute to their development of collaborative skills necessary for safe patient care. For example, we recommend nurse educators to present students with clear instructions on how to negotiate their mutual goals to enhance accuracy in a collaborative activity. Next, introducing formative peer assessment will support reflective practices and the ability to assess planned and performed activities. Furthermore, to decrease the risk of exclusion and early redemption, educators should take responsibility for dividing students into groups to allow for collaboration with peers they would not choose themselves as a means to prepare for the often complex interactions in the nursing profession.

Ethical approval

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CRediT authorship contribution statement

MS led the design, observations, and focus group discussions, and the conceptualization of this work and drafted the manuscript. MB, EM, and EC were involved in the conceptualization of the design and analysis, and provided feedback on the methodology and the manuscript. All authors gave their approval for the publishing of this manuscript.

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Conflict of interest

None.

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III

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ORIGINAL ARTICLE

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Supporting each other towards independence: A narrative analysis of first-year nursing students' collaborative process

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Abstract

Collaboration for nursing is a core competence and therefore educational interventions are essentials for collaborative skills. To identify such interventions, we carried out a study to understand nursing students' collaborative process. A narrative inquiry method was used to explore the collaborative process of first-year undergraduate nursing students. The analysis was conducted on field notes from 70 h of observation of 87 nursing students' collaboration during skills lab activities. It also included transcriptions of four focus group discussions with 11 students. The results are presented as a sequential process of (1) navigating in unfamiliar territory, (2) navigating together to cope, and (3) navigating together towards independency and the future nursing profession. We identified a transition from teacher-led assistance and guidance to student interdependency and reciprocal learning, ending with student-led assistance supporting independency. In line with Vygotsky's theory of zone of proximal development, different scaffolding interventions are needed depending on where the students are in the collaborative process.

KEYWORDS

collaborative learning, collaborative process, impressionist tale, narrative analysis, nursing students, skills lab practice, zone of proximal development

1 | INTRODUCTION

In recent years, there have been urgent calls for new educational strategies in nurse education. These calls are motivated by, on the one hand, the desire to support the learning process of current and future generations and, on the other hand, the rapid changes and increased needs in healthcare (Gunnarsdottir et al., 2021). The educational initiatives recommended to meet these needs are often grounded in collaborative learning models, such as peer learning, peer-assisted learning, and problem-based learning (Gjevjon et al., 2021). Collaborative learning models are active, student-led approaches to learning, where students learn from and with each other. Studies indicate that these models are beneficial for student learning (Boud et al., 2014), and in nurse education, they have been shown to contribute to both personal and professional development of nursing students (Markowski et al., 2021; Nelwati et al., 2018). However, these models require students to have the ability to collaborate with each other. Recent studies have highlighted the complexity of collaboration between nursing students, emphasizing the importance for nurse educators to provide their students with the skills required for effective collaboration (Le et al., 2018; Markowski et al., 2021; Stenberg et al., 2021). Nevertheless, educators often take the students' ability to collaborate with each other for granted (Le et al., 2018). Therefore, the current paper presents a narrative inquiry of the collaborative process between students during nurse education.

2 | BACKGROUND

Models for collaborative learning have become an important part of nurse education programs, presenting beneficial results for student learning. They have been shown to prepare students for the complex clinical environment by enhancing independence and learning opportunities (Markowski et al., 2021). Moreover, students have reported experiencing a sense of security when practicing with a peer and gaining the ability to manage complex and stressful situations. However, the interaction between the students has been described as a field of tension between adaptation and nonconformity (Stenberg et al., 2022). Specifically, adaptation refers to students negotiating with each other to reach a common goal in a learning activity and creating a positive learning environment by providing supportive feedback to each other, whereas nonconformity represents a risk of exclusion in the collaboration (Stenberg et al., 2022). The latter has been associated with a resistance from the students to collaborate (Stover & Holland, 2018) and lack of collaborative skills (Le et al., 2018). To overcome the collaborative barriers, nurse educators should provide support by, for example, incorporating predetermined group compositions, providing instructions on negotiation of mutual goals, and introducing formative peer assessment to support reflective practices (Stenberg et al., 2022). Importantly, we need to understand *when* during the learning process these supportive efforts are most beneficial for student learning. Namely, understanding and then aiding human learning and development require considering the development process (Vygotsky, 1980).

3 | METHODS

This narrative inquiry aimed to explore the collaborative process of first-year undergraduate nursing students' collaboration during one semester of skills lab activities.

3.1 | Theoretical framework

The theoretical framework underpinning collaborative learning is described in sociocultural theory, which asserts that human learning and development occur in social contexts together with others. This study is grounded in Vygotsky's (1980) theory of zone of proximal development (ZPD). According to Vygotsky, learning starts from learners' existing level of competence and knowledge when performing a task. On this level, learners need assistance but can subsequently and with support of more capable others (a teacher or a peer) develop until they can perform independently in their ZPD. The support from more capable others is expressed by Vygotsky as "scaffolding." Scaffolding efforts in collaborative learning comprise, for instance, introductions, instructions, structured learning activities, and feedback (Stenberg et al., 2021). Vygotsky (1980, 2012) further underlines how language and other symbols, or artifacts, act as important mediators forming the development process.

3.2 | Study design

The study has been designed according to Polkinghorne's (1997, 1995) theory of narrative inquiry. Narrative inquiry describes human experiences and actions by using stories (Polkinghorne, 1995). The story is told in a specific sequence—a beginning, middle, and an end—providing an opportunity to describe human processes or development. The interpretation of the story centers the significance, the complexity, the connections, and the uniqueness in the story and contributes to lend meaning to the phenomenon. Understanding the phenomenon can provide indications of the necessary interventions (Polkinghorne, 1995).

3.3 | Setting

The setting for the study was a skills lab at a university in southern Sweden. The lab comprised students attending the course Nursing and Preclinical Skills, which is the first course offered to first-year students in a 3-year bachelor's nursing program. Attendance is mandatory for this course, and it ends with an individual objective structured clinical examination and peer feedback. Passing the examination is required for attending the clinical practice course the following semester.

The study was carried out between January and May 2020, during which 140 students were admitted to the program. In the skills lab, the students performed practical exercises on mannequins or on each other in the presence of a nurse educator (Table 1). They alternated between performing the practical skill and observing or assisting. Students were also expected to support each other by providing feedback.

3.4 | Participants

All 140 students enrolled in the course were invited to participate in the study through written information at a learning platform. During the skills lab practice, the students were divided into 16 groups, and they remained in the same group throughout the semester. Since the study aimed to observe on a group level, consent was required from all students in the group for it to be included. Therefore, the study included 87 nursing students, divided into 11 groups.

3.5 | Data collection

In line with Polkinghorne's (1995, 1997) approach, data were collected by conducting 70 h of observations and four focus group

TABLE 1 Schedule of the course Nursing and Preclinical Skills with a focus on practice in the skills lab.

Time frame	Skills	Course obligations	Structure of the course
Beginning of the semester	– Doing basic hygiene routines (e.g., making the bed, washing, ensuring mouth hygiene) – Feeding	Mandatory	Practice in the skills lab is preceded by lectures and instruction films available at a learning platform. The practice is facilitated by a written case explaining the patient's situation and symptoms. Peer practice includes observation and feedback.
Mid-semester	– Venous blood sampling – Injections – Intravenous cannulation – Urinary catheterization	Mandatory	Practice is preceded by lectures and instruction films available at a learning platform. Practice is facilitated by a written case explaining the patient's situation and symptoms. Peer practice includes assisting, observing, and giving feedback.
End of the semester	– Scheduled optional practice – Individual objective structured clinical examination	Mandatory A pass is required in the examination for attending the clinical practice the following semester.	Peer practice includes observation and feedback. Independent examination. Feedback is provided by the nurse educator and students.

discussions. The first author informed the students in writing and orally about the purpose of the study and that participation was voluntary, that they could withdraw from the study at any time, and that the members of the research team would not be involved as educators in the course. The first author, who had previous experience of teaching in a skills lab setting, conducted the observations without connecting or conversing with either the nursing students or the nurse educators responsible for the lessons in the clinical skills lab. Descriptive field notes and reflections on the students' collaboration with each other were documented as part of the data collection and analysis. To avoid the risk of memory bias, the field notes were transcribed immediately after the observations. As narratives constitute human understanding through which individuals make sense of themselves (Polkinghorne, 1995), we invited the students to elaborate their views and experiences in a focus group discussion. Students were invited to participate in the focus groups after the course was finished through e-mail and the learning platform. Four focus group discussions were conducted with 11 nursing students by using the digital platform Zoom. Two focus groups were conducted in 2020 and an additional two were conducted in 2022 to validate preliminary findings with students who were not involved in the skills lab activities when the observations were conducted. The course in 2022 was identical in structure to the one offered in 2020 and there was consistency in what the students shared in the focus groups. The first author moderated the discussions with an observer present. A semi-structured guide was used in the discussions (Krueger & Casey, 2002), and the students were asked to talk about their thoughts on their collaboration during the activities in the skills lab. To help students develop their thoughts and to gain a deeper understanding, we used probing questions such as "What do you mean by…? Can you further develop?" The interviews lasted between 70 and 90 min and were recorded on a Dictaphone for verbatim analysis.

3.6 | Data analysis

The combined transcriptions from the field notes and focus group discussions formed the narrative of the students' collaborations with each other and were analyzed using Polkinghorne's (1995, 1997) theory of narrative configuration and employment. We have used Price et al.'s (2013, 2018) interpretation of Polkinghorne's theory by including plots, subplots, and thematic characterization within and across the narrative. Plots are sequences of a story held together by patterns of events culminating in an outcome. The plot ties the observations and students' experiences together, creating a context for understanding meaning (Polkinghorne, 1995). The themes represent both repeated events and uniqueness in the data. The first step of the analysis was reading the transcribed field notes and focus group discussions as a unit of analysis. Following Polkinghorne's focus on temporal sequence, the second step involved organizing the field notes into the following time frames: (1) the beginning of the skills lab practice, (2) mid-semester, and (3) the end of the semester, including the final examination. The focus group transcripts were also organized into those frames because participants in the focus groups did not discuss their collaboration process in a chronological order (Ylijoki, 2001). In the third step, each time sequence was read separately and coded by the first author. The codes were then clustered into tentative themes representing the significance, tension, and uniqueness in the narrative. Thereafter, the research team held discussions to ensure that the themes were connected to the participants' stories and the field notes as well as to ensure that the complexity of the stories was not lost in the process. In the next step, the plot was identified by mapping the themes in each time sequence in the order in which they happened. In the final step of the analysis, the plot from each time sequence was examined as one unit to identify the relationship between the plots, the sequences, the causality, and the similarities and differences over time.

The results of the analysis are presented by the narrative convention of an "impressionist tale" as described by Van Maanen

(2011). The feature and object of the impressionist tale is the story. Van Maanen (2011) states that

> impressionist tales present the doing of the fieldwork rather than the doer or the done … [and are] a representational means of cracking open the culture and the field worker's way of knowing it so that both can be jointly examined … [by keeping] both subject and object in constant view. (p. 102)

Thus, Van Maanen's impressionist tale is consistent with Polkinghorne's (2007) and Price et al.'s (2018, 2013) point that stories alone provide insight into the variety of lived experiences among the participants. Therefore, we have chosen to present the configured narrative through the tale of the fieldworker and through one fictive student representing the overall analysis and impressions of the observed 87 students' collaborative process and giving voice to the 11 students participating in the focus groups from the beginning to the middle to the end of the semester.

3.7 | Rigor

Polkinghorne (2007) emphasizes the need to address validity in narrative inquiry. Namely, the story must reflect the meaning as experienced by the participants as well as being rich in detail and descriptions. To accommodate validity, we have chosen to present a detailed story following a temporal sequence instead of using traditional individual quotes to confirm the findings. The research team has engaged in several discussions and frequent returns to the original transcriptions to address the plausibility of the results. We have used field notes, reflections from the field, and focus group discussions to enhance the validity of the results. Reflexivity was addressed by discussing the first author's former position as a nurse educator in the skills lab setting as prior experiences, assumptions, and beliefs will influence the research process.

3.8 | Ethical considerations

The Swedish Ethical Review Authority gave ethical approval for the study (Dnr 2019-04474). Furthermore, permission to undertake the study was given by the head of the Department of Care Science at the University. Written informed consent was obtained from the nursing students in accordance with the World Medical Association's Declaration of Helsinki (2013). Students' identity was only known by the first author and treated in strict confidence. Demographic data were not collected since students' background was not relevant to the aim of the study, and we did not intend to compare the results to explicit background variables (Gibbs et al., 2007). Moreover, students' confidentiality was protected since the fictional names in the presentation of the result represents several students rather than a single individual student.

4 | RESULTS

The results of the narrative analysis on the collaborative process between the nursing students are illustrated as a temporal sequence as experienced by the objective voice of the fieldworker and by the combined voices of the students. Thus, the collaborative process is presented as a thematic temporal sequence starting with *navigating in unfamiliar territory*, leading to *navigating together to cope*, and ending with *navigating together to approach independency and the future nursing profession*. In the students' narrative, nurse educators are referred to as “teachers.”

4.1 | Navigating in unfamiliar territory

4.1.1 | The fieldworker

At the beginning of the semester, the students entered the clinical skills lab for the first time. The beginning of the semester was characterized by the students interacting with each other for the first time. The activities that they were about to perform pertained to evidence-based basic nursing knowledge connected to making beds, washing the patients, brushing teeth, and feeding the patients. These activities are considered to be familiar to the students from their own daily life. Students with prior experiences as assisting nurses approached the activities with self-confidence and an eagerness to show their skills, whereas those without experiences of nursing experienced a lack of confidence.

4.1.2 | The student

To my surprise, the skills lab looked exactly like a real patient room in a hospital. In my mind, I had pictured a laboratory milieu with test tubes and flasks. Instead, there were mannequins properly tucked in hospital beds. Shelves and cabinets were filled with medical supplies. It felt surreal and exciting, but most of all, it was scary not knowing what awaited us and was expected of us. The first things we were about to practice were hygiene routines, and we had been informed in advance to always stick to those routines when being in the skills lab. Of course, I had forgotten to bring a scrunchie, and I was told by the teacher to tie back my hair properly. Apparently, I could not handle the most basic rules of nursing. At that moment, I felt like an elephant in a glasshouse, not deserving to become a nurse. I did not know any of the other students, and the only thing that united us at that moment was that we were all dressed in scrubs. Wearing the scrubs felt powerful, like we were real nurses; it made us feel that this was for real. However, the worst thing was yet to come—when the teacher told us to make a group of three so we could practice bedding, feeding, washing, and brushing teeth on each other. We were 16 persons standing in the room, and we did not know each other. My stomach tightened and my heart pounded. What if no one would practice with me? How should I approach the others? The teacher continued to give important instructions, but I could not listen. I just looked at the two persons standing next to me. They looked back at me. We moved a little closer to each other without saying a word, and so we became a group. I felt relieved, and at the same time, I felt sorry for the one student who did not find a group member. She looked stressed and the teacher had to assign a group for her. I felt so relieved it was not me. Then we were ready to start.

The teacher had demonstrated what we were about to practice. One of the students in my group said she had worked 4 years as an assisting nurse at the hospital. She had performed the washing of patients several times. She took command and started without hesitation. She started to pick out all the material needed on a trolley. I was so impressed because I could not remember a single thing we were going to present. She told the other student to play the patient. She accepted and crawled up the hospital bed and laid down on it. She assigned me to be the observer, a role that involved providing feedback to her once she had finished. From my point of view, she looked so comfortable and professional when performing the task and she was done rapidly. Well, she had forgotten to bring some things to the trolley, and she told me to fetch them. The problem was, I did not understand a word of what she meant. These medical terms and concepts were not familiar to me. However, I did not want to ask and risk being considered stupid. Instead, I went to the place in the skills lab where all material was kept and tried to figure out what she had meant. I also glanced at the other groups to try to find out what we had missed. Another student in our class came and stood next to me. She looked at me and whispered, "God, I feel so stupid, but do you know where the aprons are?" I smiled at her and shook my head, and I asked her if she knew what sanitary pads were? We reasoned together and finally we both found what we were looking for. When I came back to my group, the teacher had approached and commented on something my classmate had done incorrectly. Once the teacher left, the student I was practicing with told us that the teachers have no idea how it is done in the real world and that we should not pay attention to what she said. I felt completely confused. What did she mean? Were we not supposed to do as we were taught, and was it true that healthcare personnel did not follow the guidelines? I took some time to observe the other groups. One group was quite loud, laughing and joking. They seemed to talk about private matters more than focusing on practicing the tasks. Another group seemed very serious and organized in their performance. They seemed to have fun as well when discussing with each other and involving the teacher. I wished I were in that group. I was not comfortable in my group, as if the three of us did not completely match each other. I could not keep up with the student that had worked for many years at the hospital; she made me feel insecure. The other student seemed quite unengaged. She only followed what was going on in the group that was laughing and joking and did not pay much attention to us. I really wanted to learn this properly. So I decided to come well prepared for the next session. I decided to look at the instruction films and read the literature in advance. Once the student in my group had finished the activity, she turned to me for feedback. There was another moment of confusion and inconvenience. I had not a clue what to say to her. How are you supposed to give feedback when you do not know yourself what is right or wrong, and even worse, you do not have the right words to express it? I was not prepared for this, and who was I to tell her when she already had it all figured out? The way she looked at me gave me the impression that she was not expecting anything else than hearing that she did great. Therefore, I just told her she did very well even though I had identified some mistakes, but suddenly I felt so unsure, like I had to tip on my toes to not be seen as unfriendly and mean. I promised myself to find someone else to work with for the next session, someone more like me.

4.2 | Navigating together to cope

4.2.1 | The fieldworker

Mid-semester was characterized by established group constellations. Based on the observations, the groups appear to be homogeneous in age, sex, and ethnicity. Homogeneity is further visible in the students' desire to learn and develop. Some groups were study oriented, and others focused on being social. The exception from the homogeneity was the students who had prior experiences as assistant nurses, who were spread out in different groups. The activities at that point focused on nursing interventions such as blood sampling, urinary catheterization, venous cannulation, medical injections, and infusion techniques. The students experienced the interventions as complex since they lacked previous experience and reference. The complexity appears to have triggered the students to collaborate with each other to overcome and cope with the obstacles they confront.

4.2.2 | The student

We were in the mid-semester and approaching what I figured to be real nursing interventions. Even though I felt unsure of how in the world I would cope with putting a needle in the arm of a living human being or a mannequin, I felt excited, and I was well prepared. I had attended the lectures, looked at the instruction films, and read the literature. My feeling was that you could never become a nurse if you cannot handle these technical skills. The problem was that each skill contained so many different things to keep track of, such as preparing the material, providing correct information to the patient, performing drug calculation, maintaining sterility, and handling the procedures. The positive thing was that we all shared the same feeling, even those with previous healthcare experience seemed less confident at that point. This education was a mountain to climb, and to cope, I knew I needed my classmates. But the skills lab now felt like a familiar place, and I felt so comfortable with my group even though there had been some changes. The student who had not found anyone to practice with in the beginning was not attending anymore, and another student had asked to be transferred to another group. I think it was because of a conflict the other day, and I knew she had made friends in one of the other groups. Well, I had my small group of friends, and we all supported each other. We studied together in our spare time, and we started a group on social media where we could discuss with one another. We invited others into our study group as well, although some of them did not seem to be interested in participating with us and, even when they did, did not always contribute to the discussion. During the skills lab activities, we stuck together as well. It made me feel secure to be among my friends. It was easier to provide feedback to them, and we also had fun during the lab activities.

4.3 | Navigating together to approach independency and the future nursing profession

4.3.1 | The fieldworker

When the semester approached its end and thus the final sessions in the clinical skills lab, the students were able to choose for themselves what to practice in preparation for the final examination. Passing the exam was central to the students during that period, so with who they practiced seemed to be of less importance. Due to observing each other's performances, students were able to identify the individual skills and engagement of each student in their groups, so they turned to those with evident knowledge for advice. At that point, the teacher became more of a discussion partner than an instructor and organizer of the activities. The feedback between the students contained clear descriptions of what went well and constructive suggestions for improvement. The language was professional, and the students had by then reached a common terminology.

4.3.2 | The student

The only thing we all focused on during that last period of the semester was passing the final examination. It felt like my whole future was at stake, and in some sense, it was since we had to pass to be able to get access to clinical practice in the next semester. At that point, the teachers did not need to remind us to read the literature, prepare ourselves, or take notes. Most of us had constructed our own manuals and checklists, and we added to our notes whenever some new important information turned up. Me and my small group of friends still practiced together in our spare time, but when we were in the skills lab, we needed to practice different things. I had identified that female catheterization was the most challenging activity for me to perform. It was the same for another student in the group. She was the student with whom I had not felt comfortable collaborating at the beginning of the semester. I paid little attention to that by the end since my only focus was on succeeding with the catheterization. I was totally in my own head, and it felt as if I had disconnected from everything else that was going on in the room. Together we decided that I would start and that she would observe me. She asked me if I wanted her to stop when I made a mistake or if I wanted to have the feedback once I was done. I said I preferred it afterward. Once I had finished, she gave me valuable feedback and recommendations on things I should think of, and she brought up the things I had done "by the book." When it was her turn, I noticed how nervous she was. Her hand shook, so I asked her to take a deep breath, slow down, and think before proceeding because she was still a little hasty. At one point during the process, I stopped her and asked if there was anything she had forgotten. She thought hard, standing there with her sterile gloves in the air, afraid of contaminating them. "I forgot to check the patient's identity before starting, again!" While I was standing there observing her performance, I realized that I felt more secure of the procedures than she did. She had been so confident in the beginning of the semester, and I had looked up to her, thinking she knew it all. By the end of the semester, she seemed to be listening closely to every suggestion I gave her and wrote them down in her notebook.

I passed the exam. I do not remember how. All I remembered afterwards was the feeling when standing there all alone in front of my classmates and the teacher (all with a checklist in their hands) observing me while I performed periphery venous cannulation and infusion. My mouth was dry, my heart was pounding, and my memory was blank. One of my friends pointed at her arm before I started, and I knew that was a signal for me not to forget to release the stasis. Something I had forgotten every time during practice. One of the other students put a reassuring hand on my shoulder, and someone said, "Good luck" and gave me a friendly smile. They gave me feedback afterwards, but I knew exactly what I had missed without needing to hear it from them. There were some minor errors, but I could not breathe until the teacher told me I had passed. I wanted to burst out in joy, but not everyone in my group had passed, so I held the feelings to myself out of respect. Instead, we tried to support those who had failed by encouraging them and convincing them that they would succeed on the next attempt.

Well, I do not feel like an elephant in a glasshouse any longer. On the contrary, I feel like I deserve to be here. I deserve to become a nurse, and I wear my scrubs with pride. I am also proud of my fellow classmates and of what we have accomplished together. At this point, we all share a language, the medical language. I know I would never have accomplished this without them, and I feel sad that the group must split. Next semester, there will be new groups, and I will practice all these technical skills on real patients when conducting my first clinical practice. It feels exciting and scary at the same time because it will be like facing new challenges again and not knowing what is expected of me.

5 | DISCUSSION

This study portrays the development of the collaborative process between first-year undergraduate nursing students during their practice in the skills lab. It explores how different events support the students to reach independency. Based on our results, we argue that the students' collaborative process involves a transition from teacher dependency (in the beginning of the collaboration) to student interdependency and reciprocal learning (mid-semester) and finally transforms into a student-led approach leading to independency (by the end of the semester). The results provide an understanding of the collaborative process that may aid nurse educators in their effort to support student collaboration; namely, the transition that is described in the results can be used by educators to plan specified and targeted scaffolding interventions during the collaborative process.

Although students are primarily expected to support each other, previous research emphasizes the role of educators as facilitators in collaborative learning (Kirschner, 2001; Zhang & Cui, 2018). However, the facilitators' role in higher education settings is often described in general terms, such as giving instructions, monitoring, modeling, guiding, supporting, providing feedback, and assessing without considering when during the process these scaffolding efforts are most appropriate. Vygotsky's (1980) theory addresses facilitating learning based on students' individual ZPD, from a novice needing a lot of assistance to an independent student needing less assistance from more capable educators or peers. However, educators often assist students in a collective rather than individual ZPD (Shabani et al., 2010). The present study focuses on the students' collective ZPD when examining collaboration during the students' practice in a skills lab.

Early in the collaborative process, students are *navigating in unfamiliar territory*. At this stage, assistance from the nurse educator seems to be significant because the students are starting from different levels of knowledge, which affects their collaboration. Students with prior knowledge in healthcare may have experience with the execution of a task, but they are unfamiliar with using evidence-based nursing knowledge. For students with no prior healthcare education or experience, the unfamiliarity relates to being in a completely new context. These findings correspond to Vygotsky's (1980) theory in the sense that students will need assistance from a capable nurse educator when facing a new task, which, in the current study, is related to collaboration. Moreover, our results indicate that students' insecurity in the early stage is associated with an uncertainty in what is expected of them in the collaboration and in how to provide feedback to each other. The students appear to be concerned that their feedback may be considered as criticism and may impair the relationship between them. Similar findings have recently been reported by (Lerchenfeldt et al., 2019), who concluded that to decrease student anxiety and for feedback to be constructive, it needs to be preceded by clear instructions on being the observer/observed and the provider/receiver of feedback. Acknowledging peer feedback as an important component in collaborative learning, we recommend that nurse educators provide a common structure for all students to start from and offer clear recommendations on what to observe and how to formulate feedback. Standardized instructions may prevent the social relationship in the beginning of the students' collaboration from being jeopardized. However, according to Vygotsky, instructions need to be prospective. That is, nurse educators need to describe the collaboration in the skills lab to prepare students for future interactions required in the nursing profession, be they with patients, relatives, or other professionals. This may provide students with an understanding of the reasons behind the necessity of collaboration that otherwise may be questioned (Stover & Holland, 2018). Furthermore, by providing students with clear instructions, educators will highlight the collaboration as a competency itself (Roselli, 2016). However, for students to value the input from others, they need mutual trust (Coffman et al., 2023; Kantar et al., 2020; Tornwall, 2018). Our results reveal how the stress that students experience in the early stage of collaboration is associated with group affiliation and the anxiety of being left out. To avoid this, earlier research has emphasized the importance of educators taking the lead by creating predetermined groups (Stenberg et al., 2022). In addition, we argue that predetermined groups are essential early in the collaborative process. Once the students have oriented themselves and started to feel safe in the environment, they focus more on completing the task than on with whom they are collaborating.

When students begin to experience complex nursing interventions, they move toward *navigating together to cope*. They begin to organize informal collaboration outside the skills lab to succeed with the assignments. At this stage in the collaborative process, autonomy and interdependency seem to be triggered by the complexity of the skills lab tasks as well as the approaching final examination. This is consistent with previous research describing how tasks requiring interdependence with others motivate students to collaborate (Hammond & Morgan, 2022; Scager et al., 2016). Furthermore, high-complexity assignments have been shown to have a greater impact on student learning when they encourage students to collaborate to solve a problem (Kirschner et al., 2011). The complexity of the tasks seems to be an important factor, not only as a tool for learning but also as a scaffolding intervention promoting collaboration between the students. The results show how interdependency makes the differences between the students' knowledge and experience less apparent, and the collaboration becomes reciprocal when students need each other to solve a task. Moreover, the results indicate that when students with previous experiences from healthcare are challenged by more complex interventions, they become aware of the need for collaboration with others for further development. Therefore, in line with ZPD (Vygotsky, 1980), the interdependency developed between the students, mediated by the task, prompts educators to become more supportive than instructive. Considering the homogeneity created when students choose with whom to collaborate, nurse educators are encouraged to provide a supportive scaffolding intervention by paying close attention so that no student is repeatedly excluded from the collaboration. The risk of exclusion is also noted in a study by Hansen et al. (2020) that collaborative processes will contribute to maintaining social structures among students.

When students finally move to *navigating together to approach independency and the future nursing profession*, the role of the educator is still important but becomes of less significance for the students. At this stage in the process, students primarily use each other for support and can independently determine when they need support from the educator. This stands in contrast to Vygotsky (1980), who claims that independency occurs when students are supported by someone considered as more capable, for example, an educator. We conclude that independency can also develop when support is provided by student peers seemingly at the same level of capability. Similar results were presented by Kantar et al. (2020) from a clinical setting, revealing how a nursing student successively became independent in clinical practice, thus allowing the preceptor to leave the student to solve situations independently with less assistance. Our results illustrate how students take the lead by setting mutual goals and providing constructive feedback to each other without any further guidance or interference. A contributing factor to the students' independency may be that at this stage in the process, the students have developed their skills and a mutual understanding of medical terminology. According to Vygotsky (2012), a collective understanding of the language acts as a mediator facilitating the development process. Following ZPD, we argue that it is only when the students have developed their knowledge and reached a mutual language that they can offer constructive peer feedback, allowing such feedback to be a scaffolding intervention for students approaching independency.

5.1 | Limitations and further research

We have tried to reduce the risk of misinterpretation of situations occurring during the observations by conducting focus group discussions, allowing for the students to present their experiences. Furthermore, we do not claim that our results cover every student's experience of collaboration in the skills lab. Nevertheless, we believe that the results provide an understanding of the transition in the students' collaborative process through the lens of Vygotsky's development theory, and that the suggested scaffolding interventions can contribute to further develop collaborative learning. Furthermore, we acknowledge that the results are presented only from the perspective of the students. Therefore, we recommend future studies to investigate nurse educators' perception of nursing students' collaboration and their own perceived preparedness and contribution in collaborative activities. This knowledge could contribute to the development of educational strategies that support nursing students' collaboration and prepare them for the requirements and clinical practices of their future profession.

6 | CONCLUSION

This study of the collaborative process between first-year nursing students in a skills lab shows a transition in the students' collective ZPD—from teacher-led assistance and guidance to student interdependency and reciprocal learning to student-led assistance supporting independency. As a result, we argue that different scaffolding efforts are required to aid collaboration depending on where the students are during this collaborative transition. Our findings suggest that nurse educators should take the lead early in the process by introducing the students to the collaborative requirements, peer feedback, and its future implications for the nursing profession. Finally, we conclude that the theoretical framework of Vygotsky's (1980) development theory can be applied on students' collective ZPD in a collaboration between reciprocal peers supporting each other's transition to independency.

AUTHOR CONTRIBUTIONS

All authors contributed to the manuscript: Marie Stenberg led the study's design and conceptualization, observations, and focus group discussions and drafted the manuscript. Mariette Bengtsson, Elisabeth Mangrio, and Elisabeth Carlson were involved in the design and analysis and provided feedback on the methodology and the manuscript. All authors gave their approval for the publishing of this manuscript.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data are available on request from the authors.

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IV

THE PHENOMENOGRAPHIC OUTCOME SPACE OF NURSE EDUCATORS' CONCEPTION OF NURSING STUDENTS COLLABORATION IN CLINICAL SKILLS LAB

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MB, EM, and EC were involved in the design and analysis and provided feedback on the methodology and the manuscript. All authors gave their approval for the publishing of this manuscript.

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Abstract

Aim: This study aimed to understand the variety of nurse educators' conceptions of nursing students' collaboration in clinical skills lab activities.

Background: Collaborative learning has gained attention in nurse education as an educational approach that supports learning and professional development. However, research is deficient concerning nurse educators in faculty-based education and their conceptions of student collaboration.

Method: The study adopted a phenomenographic approach. A purposeful sampling of nurse educators teaching in a skills lab setting was conducted at five universities in Sweden. Individual interviews with sixteen nurse educators were performed between November 2023 and February 2024. The interviews were analysed following phenomenographic procedures.

Results: Four different description categories were identified: the purpose of collaboration, the didactic activities for collaboration, the student's intrapersonal skills, and the group activity skills. The outcome space presents the purpose of collaboration as the most complex descriptive category.

Conclusion: The educational purpose of collaboration should be settled by the faculty of nurse education and aligned to the collaborative requirements in the nursing profession. Introducing didactic activities specifically contextualized to the nursing profession and including peer observations and feedback in a formative manner may facilitate the development of collaboration.

Keywords: Collaboration, Collaborative learning, Individual interviews, Nurse educators, Nursing students, Phenomenography, Skills lab

Introduction

Collaborative learning (CL) has received considerable attention in recent years as an educational model that prepares nursing students for the collaborative demands in healthcare (Berghout, 2021; Zhang & Cui, 2018). Calls have been raised for establishing CL as a vital part of nurse education (Yang et al., 2012). They are based on the argument that CL can advance an evidence-based pedagogy in nurse education and transform the education from an individualistic teaching approach to a student-activity-oriented education (Le et al., 2018; Zhang & Cui, 2018). Nurse educators play an important role in CL by supporting and facilitating the students' development of theoretical knowledge and practical and social skills (Coetzee et al., 2018). Thus, their understanding of students' collaboration in faculty-based education influences how they teach in a CL environment. So far, research has primarily focused on students' theoretical and professional development in clinical practice using peer learning, peer-assisted learning, or collaborative learning in practice from the perspectives of students and clinical preceptors (Hill et al., 2020; Jassim et al., 2022; Josse-Eklund et al., 2022; Nygren & Carlson, 2017; Ravanipour et al., 2015; Yang et al., 2012). However, nursing research on CL in association to these educational models in a university setting has been sparse. Therefore, this study aims to explore nurse educators' conceptions of nursing students' collaboration in this setting.

Background

Collaboration has been recognized as a core competence of the twenty-first century for future employees (Evans, 2020). In healthcare professions, this is attributed to the fact that employees are part of a team and that patient care is based on intra- and inter-professional collaboration, where each employee contributes their autonomous skills to ensure safe patient care (Emich, 2018). Accordingly, healthcare educations must develop students' collaborative skills and apply learning models where students practice collaboration (Evans, 2013; Nielson et al., 2019). As an umbrella term for several collaborative educational models, such as problem-based learning, peer learning, and peer assisted learning, CL has shown to support both students' learning development and their opportunities for practicing collaborative skills (Laal & Laal, 2012). CL focuses on the role of the students in supporting each other's learning by teaching and learning from one another (Dillenbourg, 1999; Topping, 1996). It originates from socio-constructivist learning theories (Douglas, 2024); this means that learning is active (Tam, 2000), develops through social interaction and collaboration (Perry, 1970; Roselli, 2016), and is supported by culture and community (Vygotsky, 1980). When students work together and use each other's knowledge to solve a task, they practice collaboration, reflection, communication, and self and peer assessment (Boud et al., 2014; Topping, 1998). In teaching practices, CL involves encouraging students to be active partners in knowledge creation, which is necessary for nurses (Jeppesen et al., 2017; Markowski et al., 2021).

Studies of CL in nurse education have highlighted its impact on student learning, student reflective practices, and teacher organization of collaborative learning activities (Matlala, 2021; Sevenhuysen et al., 2014). However, recent research interest has been directed towards collaboration as an outcome of its own right (Evans, 2020; Liebech-Lien & Sjølie, 2021). In nurse education, this has led to studies exploring nursing students' collaborative skills (Stenberg et al., 2022), the advantages and complexities of collaboration (Cavallo, 2024), and the collaborative process (Stenberg et al., 2024). Further, some studies have addressed educational implications such as using structured activities for collaboration (Nielson et al., 2019; Stenberg et al., 2020) and inclusion of formative peer assessment (Stenberg et al., 2021). Nevertheless, the results are primarily based on the experiences of students and preceptors during clinical training, and there is limited evidence from the perspective of faculty nurse educators and about their conceptions of nurse students collaboration. Coetzee et al. (2018) emphasized the advantages of CL and the role of nurse educators in using it to develop the students cognitive and social skills. Although providing a valuable overview, their contribution is a non-systematic compilation of research conducted in the field. An evidence-based pedagogy in nurse education requires rigorous research that investigates how to prepare nursing students for the collaborative requirements of the healthcare profession through faculty-based education.

Aim

This study aims to understand the variety of nurse educators' conceptions of nursing students' collaboration during skills lab practices.

Method

The study has a qualitative descriptive design with a phenomenographic approach as presented by Marton (1981). Phenomenography originates from educational research, strives to explore the different ways people understand a phenomenon in their daily lives, and seeks to examine the dimension of 'variation' in a phenomenon (Marton, 1981; Marton & Pong, 2005). Further, it explores the collective human experience of a phenomenon rather than individual perspectives (Marton, 1981). Phenomenography does not explain how something is (first order perspective) as in phenomenology; instead, the method takes a second order perspective to describe how a phenomenon is conceived. The various conceptions of a phenomenon are visualized by a set of descriptive categories that are qualitatively different from each other (Marton, 1981).

Setting

The study was conducted at five universities across southern Sweden, all offering three-year bachelor programs in nursing. These nursing programs include campus-based practical training in technical skills in what are referred to as 'clinical skills labs', which are rooms equipped to mimic a real-life healthcare environment. The skills lab training involves, for example, basic hygiene routines, venous blood sampling, catheterization of the urine bladder, blood transfusion, and intravenous cannulation. The skills labs were chosen as the setting for this study because they provide training in collaborative skills; specifically, the attending students practice together in teams of two or in small groups. The studied nursing programs varied regarding the semester in which the practical training takes place, but all practical training courses were preceded by theoretical preparatory courses.

Participants

We applied purposeful sampling for the recruitment of nurse educators to obtain variation (Marton & Booth, 2013). The nurse educators were faculty members employed at the five selected universities and had teaching assignments in the skills labs. The heads of the nursing program at each university were contacted for permission to carry out the study and to provide contact information for potential gatekeepers. After receiving contact details, the suggested gatekeepers were contacted and provided with information about the study. The gatekeepers informed all educators at the respective skills lab. Twenty educators expressed interest to participate and were contacted via e-mail by the first author, of which four did not respond. Thus, the sample size was sixteen participants, which was within the recommended range for capturing variation in a phenomenographic study (Stenfors-Hayes et al., 2013). Of the participants, fourteen were women and two were men, and they were all aged from thirty-six to fifty-six years (with a mean age of forty-six years). The nurse educators had been employed at their respective faculties between eleven months to eleven years (with a mean of four years). Regarding positions, the participants comprised ten lecturers, of which two also held a joint position as PhD-students; three associate senior lecturers; two senior lecturers; and one associate professor. All the participants had a background as registered nurses, and seven of them had a postgraduate degree in specialist nursing. During the skills lab training, the nurse educators' role was to teach, support, assess, and grade the students.

Data collection

Data were collected through individual interviews. To critically appraise the understanding of the question (Kvale, 1996) and to check for the quality of the recording, we conducted a pilot interview with an educator employed at the same university as the research team members. No adjustments were necessary, and the pilot interview was not included in the analysis. The interviews were performed and recorded using the digital tool Zoom for its flexibility in scheduling interviews and for environmental consideration. The interviews were conducted by the first author between November 2023 and February 2024. All interviews started with the question, 'What is your opinion on students' collaboration during skills lab training?' A checklist of subjects was available to provide prompts (Adams, 2015), but it was not used during the interviews as the participants freely expressed their opinions. However, probing questions such as 'Can you elaborate?' were used because they provide a deeper understanding than the main questions in an phenomenographic study (Åkerlind, 2023). The interviews lasted between forty-seven and ninety-five minutes (with a mean of 69 minutes). Written memos were taken during the interviews and used to summarize what was being discussed, offering the participants the opportunity to clarify, elaborate, and correct it if necessary. Further, the memos helped the first author reflect on the conduct of the interviews immediately upon their completion (Halcomb & Davidson, 2006). The recorded interview data were transcribed verbatim by the first author.

Data analysis

The analysis followed the phenomenographic iterative seven-steps procedure as described by Dahlgren and Fallsberg (1991). The first step involved *familiarization* with the material; it was conducted by the first author first by carefully listening through the interviews to get acquainted with and get a feeling of the content and then by reading the transcripts and comparing them to the fieldnotes. In the second step, the first and last author separately made a *condensation of significant statements* corresponding to the aim of the study by marking meaning units in the transcripts. The marked units were then copied into a joint document. The third step involved the research team *comparing the significant statements* to find agreements or differences. In the fourth step, similar statements were *grouped* together in different conceptions distinct from one another. In the fifth step, the essence of each of the conceptions was *articulated* in descriptive categories, which were *labelled* in the sixth step based on their core meaning. In the seventh and final step, the descriptive categories were *contrasted* to find differences and similarities. The analysis procedure in steps four to six was nonlinear, going back and forth and requiring several discussions within the research team concerning the distinctness of the categories. Consideration in the discussions in the research team was also taken to the first author's experiences from working with students collaborating in various contexts. To reflect the various conceptions in each descriptive category, we used quotes when presenting our results. The results of the analysis are presented in Table 1.

Table 1. Categories of nurse educators' conception of student collaboration in clinical skills lab practices.

Concepts	**Contrasting Categories**	**Descriptive category**
-Suitable for organizing skills lab practices -Time saving	Pragmatic purpose	The purpose of collaboration
-Supporting teaching and learning -Learning outcomes for collaboration	Educational purpose	
-Preparing for practice and teamwork in the profession -Building social networks for the future	Prospective purpose	
-Information on the group activity -Introduction -Group affiliation	Collaborative preparations	The didactic activities for collaboration
-Peer feedback -Peer observations -Structured activities	Collaborative activities	
-Attitude to collaboration -Attitude to education -Attitude to fellow students -Attitude to educators	The student's attitude	The intrapersonal skills
-Interest -Motivation -Ambition -Engagement -Respect -Seriousness	The student's behavior	
-Knowledge foundation -Knowledge preparation -Experiences	The student's knowledge	
-Being inclusive -Using each other's knowledge -Finding solutions	Peer group support	The group activity skills
-Planning together -Observing, providing, and receiving feedback -Role playing -Discussing perspectives	Peer group activity	

Ethical considerations

Ethical approval was obtained from the Swedish Ethical Review Authority (Dnr 2022-02516-02). The study was conducted in accordance with the Helsinki Declaration (World Medical Association, 2014, 2024). Written consent was obtained from the heads of departments at the universities where the nurse educators were employed. The nurse educators were contacted via e-mail, informed of the research purpose, and invited to participate in the study. Importantly, the e-mail contained an attached information letter stressing that participation was voluntarily and that non-participation would not affect the individual educator in any sense. Further, the nurse educators who agreed to participate received letters of consent which they were required to sign prior to the interviews. None of the researchers were employed at any of the universities included in the study, which has facilitated a neutral relationship with the participants. Moreover, the data collected and used in this study have been kept in a secure archive at the university, and only those responsible for the study (i.e. the research team) have had access to the data. Personal data such as age, gender identification, professional background, and years of professional experience as a nurse educator were collected to illustrate the variation of the respondents. In addition, the quotes presented with the results were anonymized to ensure that no individual participant can be identified.

Results

The results showed an agreement among the nurse educators regarding both the importance of nursing students practicing collaboration and the responsibility of nurse educators to offer collaborative activities during nursing education. The variation in nurse educators' conception of nursing students' collaboration comprises four descriptive categories: the purpose of collaboration, the didactic activities for collaboration, the students' intrapersonal skills, and the group activity skills exemplified by quotations from the interviews.

The purpose of collaboration

For the nurse educators, the purpose of having students collaborate with each other during the skills lab training was either pragmatic, educational, or prospective. The pragmatic purpose was that group activities were necessary for managing the number of students in the skills lab. According to the participants, the admission of students into nursing education has increased and coincided with a reduction of teaching hours at the clinical skills lab. Therefore, making the students practice together encouraged them to assist each other, which made the training sessions effective and time efficient. The centre of attention was the performance of the technical skills, and the collaboration between the students was the practical way to organize the training sessions.

> The focus is on practicing the skills, not on the collaboration between students, on the other hand the activities require that at least two or three students work together to be able to complete the activity.

The educational purpose was evident in the participants' perception that letting the students collaborate as peers facilitated both student teaching and learning. The educators referred to the educational models as peer learning, problem-based learning, or active learning as pedagogic frameworks for the collaboration and the practice of clinical skills. The learning included collaborative skills related to nursing. Finally, the prospective purpose was connected to the importance of practicing collaboration with others as preparation for the nursing profession, where the nurse is a member in a healthcare team. The educators referred to their own experiences as registered nurses and emphasized the necessity of having collaborative skills in the profession. They thought that practicing collaboration should be integrated into the education from start to finish.

> It's not just about collaboration between nurses, but also between health care organisations and different health care professions. We need to talk about these issues to prepare students for their profession.

The didactic activities for collaboration

The qualitatively different conceptions of student collaboration also concerned the didactic activities and included preparations and instructions. Some educators considered preparation as essential to set the framework for collaborative expectations in the skills lab training, and it was carried out through a course introduction. Codes of conduct were introduced and were seen as important; although the educators thought students showed respect for each other, they had also experienced inappropriate behaviours. The introduction further included the presentation of structures for observing others' performances so that the students could provide feedback to each other during or after the training sessions.

> Students are introduced to the skills they will practice as well as how to collaborate and behave towards each other, showing respect for each other's learning.

In contrast, some educators expressed how they expected and took for granted that adult students had the ability to collaborate with each other and therefore saw no reason for introductions or structures. Instead, their skills lab training was preceded by an introduction focusing on the activity about to be practiced (e.g. catheterization, peripheral venous cannulation, etc.), and the students were informed through educational platforms and study guides that they would have to work together in pairs or in small groups during the practices.

> The information students receive before the skills lab practices is to be prepared for the skills itself, the collaboration between students is just something that we take for granted and will happen by itself.

The educators presented various conceptions regarding how group allocation was structured. Some described it as something the students were able to handle for themselves without educator involvement. They believed that letting the students choose for themselves who they wanted to practice with makes the students feel secure because they would be practicing with a friend or friends. Other educators considered students who had previous experience as health care assistants or assistant nurses as knowledgeable resources during training, so they allocated them to support students without healthcare experience.

> I try to pair students with previous experience in health care with those without so the more experienced students can support the other.

Finally, some educators believed that groups should be randomly selected by the educators in advance because the students should be able to collaborate with everyone since this is expected of them once they become nurses. Moreover, random groups were expected to prevent the formation of homogenous groups and prevent students from being left out in the collaboration.

> I think it would have been better if we paired the students. Because when you have a group of students, there are always a few who are never chosen, so you remove that, and I think that is important.

Furthermore, constructed learning activities were perceived to structure the collaboration and support the students' learning development. Nurse educators explained how the learning activities of the skills lab included guidance for peer observations and peer feedback to achieve constructive feedback between the students. Other educators acknowledged having no experience in using activities for collaboration or peer reflection after the students finish practicing a skill. Some expressed that feedback was either provided by them or by the students in the form of self-reflection of the performance, but neither form involve reflections and feedback between peers.

The intrapersonal skills

The educators connected the collaboration between students to the individual student's collaboration skills and attributed its success to the student's attitude, behaviour and knowledge. According to the educators, students' attitudes linked to the education or educator not reflecting how healthcare is delivered 'in reality' influenced and created uncertainty among fellow students. Further, they perceived students' attitudes regarding participating in group activities, particularly their negative feelings about working in teams and practicing with others, as affecting collaboration.

> Some may say that they find it difficult to work with people. Someone has told me that this teamwork thing is not for me.

Showing interest and being motivated, ambitious, and engaged were described as behaviours that built trust among the students. Similarly, knowledge was perceived as important for collaboration. For instance, by being prepared for the activity, the student could contribute more and take an active part in discussions with peers. In contrast, an unprepared student could create feelings of frustration among fellow students and be considered a 'free rider'.

> How they collaborate with each other depends a bit on the students' attitude, how they have prepared and how they can communicate and support each other.

The students' life experiences and knowledge acquired from previous employment, mainly in health care, were seen to both support and disrupt the collaboration. They were considered supportive in that experienced students could assist students without experience and disruptive when these students do not have the correct knowledge for an activity and could take up too much space from other students without experience.

> There are assistant nurses who sometimes study to be registered nurses and think that they know a lot and what to do and are not humble before the new role. It is probably a matter of ignorance at its core. But it can be difficult in the long run if they do not change their way of looking at the different roles and their own prior knowledge.

The group activity skills

The nurse educators connected the success of collaboration between the students with peer support and activity in the group. The educators shared similar understanding of the outcome of group activities. They believed that most of the students appreciated collaborating with each other and said that group activities usually worked satisfactorily. In cases when the collaboration was supportive, the students adapted and showed respect for each other's knowledge and contribution. These groups were often inclusive, making sure everyone had a peer to practice with and offering solo students to join their group.

> They try to collaborate and support each other, they ask each other questions, seek each other's help, and they turn to each other first.

The nurse educators considered students' actions such as communicating, asking questions, and instructing each other as important group activity skills that supported the collaboration. They described how their students complemented each other's knowledge and planned the structure of conducting the activity together, which created a flow in their performance. The educators explained how, by discussing the activities with each other, the students found solutions together without first consulting them, which they believed was a good learning environment. For example, one educator described how the students in an active group observed each other's performances and spontaneously gave each other feedback even when it was not always a requirement.

> An extremely good collaboration then everything just flows, I don't have to say anything, it just rolls on, they help each other, and they give each other feedback. You don't have to say much, they do most of the work themselves. I think that is wonderful.

The educators also thought that the students were often open to feedback from their fellow students, although there were occasions when the students became defensive and tried to argue against the feedback they received rather than reflect on it.

Despite the mostly positive perceptions, some educators noticed that some student groups lacked the ability to communicate with each other during the exercises, affecting the group activity negatively. Thus, they emphasized that someone taking the lead was crucial for collaboration, in addition to planning the actions ahead of conducting the activity. If none of the students did, the educators saw it important to guide them in the right direction. A further reason for when collaboration did not work in groups was associated to some students being excluded from participation. The educators referred to this as adult bullying. The educators described instances of direct exclusion through, for example, students making intimidating verbal comments in front of other students or using body language with non-supportive mimics and gestures.

Outcome space

The logical relationships between the descriptive categories in a phenomenographic study can be presented in an ‘outcome space’. Each category is distinct but related to the other categories. Together, they form a larger cohesive whole of people’s various conceptions of a phenomenon (Marton & Booth, 2013). During the iterative process of analysing nurse educators’ conceptions of nursing students’ collaboration, we identified that the descriptive categories ‘the purpose of collaboration’ and ‘the didactic activity for collaboration’ are both related to the educational organization of collaboration. Further, the categories ‘the students’ intrapersonal skills’ and ‘group activity skills’ as related to the students’ *abilities* to collaborate. In a phenomenographic study, the hierarchical structure of the outcome space rests on the most complex and inclusive descriptive category from which the other categories can be understood but never the other way around (Åkerlind, 2023). In the current study, this hierarchy is based on *the purpose of collaboration* logically guiding the didactic activities for collaboration and influencing the intrapersonal and group activity skills (Figure 1).

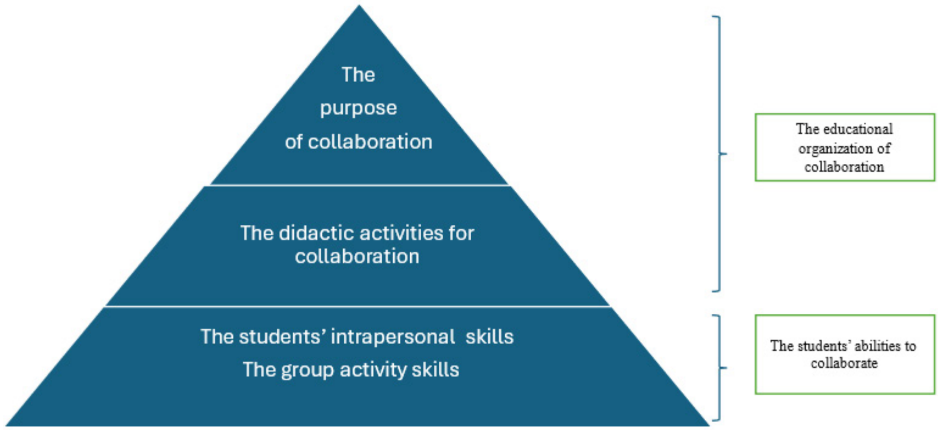

Figure 1. The outcome space of nurse educators' conception of nursing students' collaboration during skills lab

Discussion

This study aimed to explore nurse educators' various conceptions of nursing students' collaboration during skills lab activities. The most prominent finding stems from the nurse educators' different conceptions of the purpose of collaboration which confirms previous reports of collaboration as either as a primary teaching approach or a supplementary component in teaching (Liebech-Lien & Sjølie, 2021; Zhang & Cui, 2018). Although it is necessary to reflect on faculty resources when organizing CL (Jervis & Jervis, 2005; Tolsgaard et al., 2016), the educational implications of students' collaboration must also be considered (Topping, 2005). To develop an evidence-based pedagogy in nurse education, we suggest that the educational purpose of CL is decided and introduced by the faculty, making it transparent for both educators and students. Furthermore, we argue for the use of didactic activities for instructional guidance on how and what the students are supposed to collaborate on. Such guidance should imitate collaboration in the profession by, for example, instructing the students to plan and distribute the work together before carrying out a task. Didactic activities can also prevent random teaching strategies depending on which educator is teaching the class and instead offer consistency in learning. Using didactic questions that are contextualized to the nursing profession could facilitate the transfer of collaborative knowledge to the prospective purpose of collaboration in this profession. In addition, including instructions for nurse-specific peer observations and feedback could support student learning and approach to the profession. Performing similar activities have shown to strengthen students' ability to collaborate and increase their opportunities to reflect on daily nursing practice (Cavallo, 2024; Stenberg et al., 2020; Stenberg et al., 2021). Furthermore, we agree with Boud and Bearman (2022) suggestion to use of formative peer assessment, such as introducing structures for peer observations and feedback, as a way to assess collaboration. Recent findings on nursing students' collaborative process reveal that feedback is developed from unstructured to constructive when provided between peers (Stenberg et al., 2024). Notably, these structures for collaboration and feedback become important considering that students' ability to collaborate is not something that can be taken for granted by educators. Similar results were reported in previous studies that highlight the need to teach and foster collaboration (Cavallo, 2024; Liebech-Lien & Sjølie, 2021), and other studies have confirmed a resistance from nursing students to collaborate (Cavallo, 2024; Stover & Holland, 2018).

However, what appears essential to teach is not merely collaboration as a social practice but rather collaboration contextualized to the collaborative requirements specified for the nursing profession. In addition, associating the collaborative expectations to the profession could prevent collaborative behaviours that lack professionalism. As professionals, the students will be required to collaborate interprofessionally to deal with patients and next of kin in several constellations, situations, and contexts. To prepare them for this, we recommend nurse educators to take the lead and randomly allocate students to groups to offer them the opportunity to interact with and reflect on their own behavior through these diverse interactions. Similar efforts have proven to be effective, not least for first-year nursing students (Cavallo, 2024). The intrapersonal and group activity skills identified in this study confirm findings of students either possessing the ability to adapt to a collaborative context or not (Stenberg et al., 2022). Although we could not identify a hierarchy between the intrapersonal and group activity skills, the recommended activities may facilitate the student's development of these skills and reduce the described collaborative challenges, thereby preparing nursing students for the collaborative requirements of the profession.

Conclusion

Nursing students' ability to collaborate cannot be taken for granted. To support the development of collaborative skills, educators should determine the educational purpose of collaboration and align it to the collaborative requirements of the nursing profession. Introducing didactic activities specifically contextualized to the profession and including peer observations and formative feedback may provide support for educators and facilitate the development of collaboration in CL.

Limitations and further research

The conclusion in this study is drawn from the various conceptions of nurse educators in a Swedish educational context, which may differ from other educational contexts. However, considering collaboration as a generic skill, we believe this study can provide directions that can assist educators in other CL contexts and be of interest for an international nursing and healthcare audience. We recommend further research on nurse educators' need for support when facilitating students' collaboration in CL due to the limited knowledge within the field and the need for further contributions to evidence-based pedagogy in nurse education.

Ethics

The Swedish Ethical Review Authority gave ethical approval for the study (Dnr 2022-02516-02).

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ABSTRACT

Introduction In formative peer assessment, the students give and receive feedback from each other and expand their knowledge in a social context of interaction and collaboration. The ability to collaborate and communicate are essential parts of the healthcare professionals' competence and delivery of safe patient care. Thereby, it is of utmost importance to support students with activities fostering these competences during their healthcare education. The aim of the scoping review is to compile research on peer assessment presented in healthcare education programmes, focusing formative assessment. The result of the scoping review will form the basis for developing and conducting an intervention focusing collaborative learning and peer assessment in a healthcare education programme.

Methods and analysis The scoping review will be conducted by using the framework presented by Arksey & O'Malley and Levac *et al*. The primary research question is: How are formative peer assessment interventions delivered in healthcare education? The literature search will be conducted in the peer-reviewed databases PubMed, Cumulative Index to Nursing and Allied Health Literature, Education Research Complete and Education Research Centre between September and December 2018. Additional search will be performed in Google Scholar, hand-searching of reference lists of included studies and Libsearch for identification of grey literature. Two researchers will independently screen title and abstract. Full-text articles will be screened by three researchers using a charting form. Studies meeting the inclusion criteria will be critically evaluated using the Critical Appraisal Skills Programme. A flow diagram will present the included and excluded studies. A narrative synthesis will be conducted by using thematic analysis as presented by Braun and Clarke. The findings will be presented under thematic headings using a summary table. To enhance validity, stakeholders from healthcare education programmes and healthcare institutions will be provided with an overview of the preliminary results.

Ethics and dissemination Research ethics approval is not required for the scoping review.

Strength and limitations of this study

- ► The result of the scoping review will establish a baseline for understanding the concept of formative peer assessment in healthcare education programmes prior to developing an intervention focusing peer assessment in a healthcare education programme.
- ► A systematic search strategy will be conducted in four electronic databases with peer-reviewed literature, including search in library databases for inclusion of books, e-books and grey literature.
- ► Search strategies will be developed in collaboration with a research librarian well versed using research databases.
- ► No formal quality assessment will be conducted as the scoping review aims to provide a map of the landscape of formative peer assessment in healthcare education.
- ► Only articles and documents published in English will be included.

INTRODUCTION

Peer assessment is described as an essential part of collaborative learning since students exercise their ability to give and receive feedback.[1] This supports students in gaining insights and understanding of assessment criteria and their personal approach to an assessment task mirrored in a peer.[1] Furthermore, peer assessment helps students to develop judgement skills, critiquing abilities and self-awareness.[1] It can be defined as 'an arrangement in which individuals consider the amount, level, quality, or success of the products or outcomes of learning of peers of similar status' (Topping and Ehly, p118).[2] Peer assessment has been described in a variety of contexts and with various aims including measuring professional competence of medical students,[3] as a strategy to enhance students' engagement in their own learning,[4 5] and development of employability skills for students in higher education.[6]

In a peer-assessment activity, students take responsibility for assessing the work of their peers against set assessment criteria,[1] and can be conducted as summative or formative assessments. The purpose of summative assessment is the grading and evaluation of students' learning.[7] On the other hand, formative assessment focus the development of students' learning processes.[8] In formative peer assessment, the intention is to help students help each other when planning their learning.[9] The students expand their knowledge in a social context of interaction and collaboration according to social constructivism principles.[10 11] In this social context, they identify their strengths and weaknesses and develop metacognitive, personal and professional skills.[9] It is conversational in nature[12] and fundamental is the use of feedback. Feedback is an integral aspect of peer assessment[7] with the intention to enhance student learning.[13]

A recent published review of assessment in higher education[14] raised the issue that studies on peer assessment are deficient in referring to exactly what peer assessment aims to achieve and in addition empirical investigations are missing. Boud *et al*[1] highlighted the importance of a shift in assessment, from individualistic assessment approaches to peer assessment if collaboration such as manifested in collaborative learning models is to be fostered. The ability to collaborate, communicate, assess, give and receive feedback are essential parts of healthcare professionals' competence and delivery of safe patient care. Thereby, it is of utmost importance to support students with activities fostering those competences during their healthcare education. These competences are related to professional teamwork, as well as broader goals for lifelong learning, and as argued by Boud *et al*[1] address course-specific goals not readily developed otherwise. Therefore, the scoping review of peer assessment in higher education will act as an important guide prior to develop an empirical investigation focusing peer assessment interventions in a healthcare education programme.

METHOD

A scoping review aims to map the concepts, main sources and evidence available in a particular research area to get a broader understanding of a specific subject[15] and has increased in popularity in recent years in health and social sciences.[16] Scoping reviews are often conducted as a preliminary investigative process that help the researchers to formulate a research question and develop research proposals[17] and as essential basis for curriculum development and programme implementation.[18]

This scoping review will be conducted by using the York methodology by Arksey and O'Malley[15] and taking into consideration recommendations presented by Levac *et al*.[19] A scoping review follows a six-stage process including: (1) identifying a research question; (2) identifying relevant studies; (3) study selection; (4) charting the data; (5) collating, summarising and reporting the result; and (6) consultation.[15 19] This six-stage process associates with the process in conducting a systematic review. They both use rigorous and transparent methods to identify and analyse all the relevant literature pertaining to a research question.[20] This scoping review does not aim to assess the quality and validity of the studies in order to synthesise best practice guidelines as in a systematic review. Rather, it aims to get a broad picture and to highlight recent efforts and key concepts of peer assessment as an integral component for students in higher education. Therefore, this scoping review need to include a greater range of methodologies and study designs than what would be possible in a systematic review, that often focus on randomised controlled trials.[15]

Furthermore, a scoping review can be of use when a topic is of a complex or heterogeneous nature[21] and as an essential basis for curriculum development and programme implementation.[18] Since the literature on peer assessment is extensive and with some ambiguity in precise definitions[14] and conducted in varying contexts in higher education, this method seemed appropriate to answer the research questions. In other words, peer assessment is multifaceted, and a scoping review may provide the researchers with a broad and in-depth knowledge of this particular subject. The reported result will be essential for conducting further development of an intervention aiming to implement and evaluate peer assessment as part of a collaborative learning approach in a healthcare education programme.

Stage 1: identifying the research question

The aim of this scoping review is to compile research about peer assessment presented in higher education, focusing formative assessment. The primary research question is:

- How are formative peer assessment interventions delivered in healthcare education?

Further questions to be answered are:

- What are the rationales for using formative peer assessment in healthcare education?
- What experiences of formative peer assessment are presented from the perspective of students and teachers in healthcare education and in what context (eg, clinical practice, preclinical and theoretical courses)?
- What outcomes are presented from formative peer assessment interventions?

Levac *et al*[19] recommend a clear articulation of the research question. In a systematic review, the question to guide the search is often based on the 'Population Intervention Context Outcome' elements. Since a scoping review has less restrictive inclusion criteria than a systematic review, the 'Population Concept and Context' elements (table 1) can be used to establish effective search criteria.[22]

Table 1 The Population Concept and Context mnemonic as recommended by the Joanna Briggs Institute[22]

Population	Concept	Context
Students assessing students	Intervention, rationale, outcome, context and experience of formative peer assessment.	Healthcare education programmes in higher education.

 Stenberg M, *et al*. *BMJ Open* 2018;**8**:e025055. doi:10.1136/bmjopen-2018-025055

Stage 2: identifying relevant studies

The literature search will be conducted in the peer-reviewed databases, PubMed, Cumulative Index to Nursing and Allied Health Literature, Education Research Complete and Education Research Centre. Search tools such as Medical Subject Headings, Headings, Thesaurus and Boolean operators (AND/OR) will be used to expand and narrow the search. Additional search will be performed in Google Scholar, hand-search reference lists of included studies and Libsearch for identification of grey literature. The search will be conducted between September and December 2018. No limitations will be set to the year of publication. Finally, search strategies will be developed in collaboration with a research librarian well versed in research databases.

Inclusion and exclusion criteria

The following inclusion criteria will be applied in the search: (a) the articles have to address peer assessment in higher education; (b) focusing formative peer assessment; (c) students in healthcare education programmes; (d) peer reviewed articles, grey literature, books and so on; (e) studies evaluated with moderate or high methodological quality according to the Critical Appraisal Skills Programme (CASP).[23] Initially, the search terms will be purposefully broad (eg, peer assessment, higher education) in order to capture the range of published literature. However, the extensiveness of material will determine if more narrow inclusion criteria are necessary for managing the material.

Since the distinction between different assessment terms and how different authors define peer assessment varies,[14] similar concepts related to peer assessment, for example, peer feedback and peer evaluation, will be incorporated in the search to ensure that no study is missed due to ambiguity in definition of the subject.

Articles including summative peer assessment will be excluded unless the study involves formative assessment. However, a distinction between the two must be transparent if the study is to be included. If there is any uncertainty, the study will be excluded. Furthermore, full articles, abstracts, conference posters or power point presentations unavailable for review will be excluded.

Stage 3: study selection

Initially, the title and abstract will be screened by two members of the research team. The team may at this stage need to discuss the inclusion and exclusion criteria and refine the search.[19] If the title is in line with the review purpose, the abstract will be read. This procedure will be conducted by two researchers separately, guided by the inclusion criteria and research questions. If any disagreement appears, a third research member will be consulted. This initial step will determine whether the criteria capture relevant studies. Further, the full-text articles will be imported into the web-based bibliographic manager RefWorks 2.0 to enable removal of duplicates and for organisational feasibility. Each paper will be given a unique number for identification and to keep track of included and excluded articles.[24]

Stage 4: charting the data

The full-text articles will be screened by three researchers independently. A charting form will be used for managing the documentation of extracted data from the included studies. The charting form will include the inclusion criteria and an explanation of why the study is included or excluded at this stage in the process. If there are any reservations or discordant opinions a fourth researcher will be consulted until consensus is reached. Studies meeting the inclusion criteria will be critical evaluated using CASP.[23] The methodological quality will be graded with moderate when meeting 6–8 criteria and high 9–10 criteria of the CASP checklist.[25] To enable replications by others, increase reliability of the findings and for methodological accuracy[15] the process will be documented using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) presented by Moher *et al*.[26] The PRISMA flow diagram visualise selection process of included and excluded articles during each stage of the search process. The PRISMA checklist will support rigour report of the review using the 24 item checklist.[26]

Stage 5: collating, summarising and reporting results

Collating and managing the results from the included articles will be conducted by using a data analysis software program, NVivo V.11. NVivo is a code-based system developed to support structured qualitative data.[27] Even though, the analysis part of the data material needs to be abstracted by the researcher, the software may support an overview of codes, themes and their relationships and connections.[27]

We will perform a narrative synthesis using an inductive methodology. Analysing the qualitative data will be conducted by using the principles for thematic analysis as presented by Braun and Clarke.[28] Thematic analysis is a method for identifying, analysing and reporting patterns within data[28] and has a both qualitative and quantitative methodology.[29] It allows a large amount of data and can highlight differences and similarities across a data set. The themes will be identified at a semantic level from the written text.[28] To maintain quality and trustworthiness each stage of the data analysis will be presented in a scheme.[28] The findings will be presented under thematic headings using a summary table which can inform a description of key points. Further, detailed tables will present: (a) author(s), (b) the geographical distribution of studies, (c) year of publication, (d) educational interventions presented, (e) the professional healthcare programme that the studies refers to, (f) reported experiences, outcome and main findings of peer assessment initiatives and (g) research methodology.

Stage 6: consultation

Consultation is an optional stage[15]; however, since it adds methodological rigour[19] it will be incorporated in the scoping review. The consultation will be conducted when preliminary results are organised in charts and tables (stage 5). Stakeholders from healthcare education programmes (students and teachers) and healthcare institutions (preceptors) will be provided with an overview of the preliminary results. The purpose of the consultation is to enhance the validity of the study outcome.

ETHICS AND DISSEMINATION

Information will only be extracted from public databases. The result of this scoping protocol will form the basis for conducting a scoping review of formative peer assessment in a healthcare education programme. The results will be presented at national and international conferences and published in peer-reviewed journals.

Contributors MS led the design, search strategy and conceptualisation of this work and drafted the protocol. EM, MB and EC were involved in the conceptualisation of the review design, inclusion and exclusion criteria and provided feedback on the methodology and the manuscript. All authors give their approval to the publishing of this protocol manuscript.

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Competing interests None declared.

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Ethics approval Research ethics approval is not required for a scoping review.

Provenance and peer review Not commissioned; externally peer reviewed.

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