Examination of Classroom, Clinical and Simulation Learning Environments in Undergraduate Nursing Education

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Abstract

Through undergraduate nursing education, students must acquire broad knowledge in nursing and related sciences to provide safe, competent, ethical, and effective nursing care (Canadian Association of Schools of Nursing [CASN], 2014). Undergraduate nursing programs must provide “the foundation for sound clinical reasoning and clinical judgment, critical thinking, and a strong ethical comportment” (CASN, 2014, p. 1). Through review of the literature, this paper describes how the various learning environments (LEs) utilized in baccalaureate nursing education, including classroom, clinical, and simulation environments, are effective in meeting the needs of undergraduate nursing education. Strengths and weaknesses of each LE are described, compared, and contrasted. The results of the literature review demonstrate that classroom, clinical, and simulation LEs all stimulate critical thinking and may be negatively impacted by faculty preparation or limitations unique to the specific environment. However, it is apparent that classroom, simulation, and clinical LEs are essential elements of undergraduate nursing education that complement one another. All three LEs must be utilized effectively within undergraduate nursing education in order to prepare practice-ready nurses. Further research is recommended, particularly with respect to the emerging simulation-based LE.

The complexity of today’s healthcare system demands that new graduates be prepared to care for acutely ill and highly complex patients in increasingly diverse settings. Educators are continuously seeking innovative methods to better prepare nursing students to engage in critical thinking and reflection that are needed for evidence-based practice. To meet these challenges, educational approaches to teaching and learning must be examined in view current economic constraint, student satisfaction and readiness for practice. It is critical that undergraduate nursing education prepare nurses with foundational knowledge in nursing and health sciences including relational practice to transition to a variety of healthcare environments. With advancement of innovation and technology in the classroom, it prompts nursing educators to determine the most effective teaching methods. This paper will focus on different learning environments and how they contribute to the undergraduate nursing students’ learning. The function, strengths, and weaknesses of the classroom, clinical, and simulation learning environments (LEs) currently used in undergraduate nursing education will be explored, compared, and contrasted. Implications for undergraduate nursing education will be discussed.

Background

The overall function of undergraduate nursing education is to prepare each student to have broad knowledge in nursing and related sciences to provide safe, competent, ethical, and effective nursing care (Canadian Association of Schools of Nursing [CASN] [1]). Learning is highly individualized and unique to the learner, while at the same time nursing educators are tasked with creating learning opportunities that promote the best possible educational outcomes. In the CASN (2014, p.1) Position Statement on Baccalaureate Education, the requirement for undergraduate nursing programs to provide “the foundation for sound clinical reasoning and clinical judgment, critical thinking, and a strong ethical comportment” is identified. Understanding how the various LEs utilized in baccalaureate nursing education, including classroom, clinical, and simulation-based learning environments, and the various instructional methods applied within these environments are effective in meeting the needs of undergraduate nursing education is essential.

Learning Environments

Learning that occurs within undergraduate nursing education must support the acquisition and/or demonstration of knowledge, skill, and judgment related to required entry to practice nursing competencies (CNO, 2014 [2]). Accommodating diverse learning styles, different lifestyles, and available resources, there are a variety of LEs to meet students’ needs and fulfill the educational mandate [3]. For the purposes of this paper, three common LEs will be reviewed, including classroom, clinical, and simulation.

For much of the history of modern undergraduate nursing education in North America, use of the classroom LE dominated nursing education [4]. More recently, educators in nursing and other health professions have employed more student-centered learning approaches to their teaching, not only through the addition of new types of LEs, but also within the classroom LE itself. These include small group work and integrated case study teaching [4]. The clinical LE is an integral component of nursing education, essential to support students’ knowledge development and translation from theory to practice [5]. During the clinical experience, students practice nursing skills, consolidate their learning, and demonstrate their achievement of the competencies required of the novice registered nurse [6]. The final LE that will be discussed in this paper is simulation-based learning experiences. Increasingly, contemporary nursing programs are faced with rising enrollment, decreased availability of clinical placements, and a shortage of specialty placements that provide students with necessary experience to meet the demands of the workplace [7]. In response, simulation rapidly is becoming a critical LE that provides opportunities for students to engage in experiences that may not otherwise be available. The use of simulation has grown substantially over the past ten years [8], largely in response to the patient safety agenda. This paper will provide an overview and analysis of these three common LEs in undergraduate nursing education (classroom, clinical, and simulation).

While beyond the scope of this paper, it is important to note that these are not the only LEs available to undergraduate nursing students. For example, in recent years, the number of course offerings provided through online or virtual LEs or in hybrid format has increased. However, classroom, clinical, and simulation LEs are most commonly utilized for undergraduate nursing education. Consequently, for each of these LEs, an overview of the function, strengths, and weaknesses will be provided. Finally, these LEs will be compared and contrasted, with an analysis of the effectiveness of each.

The Classroom Learning Environment

Classroom based LEs are well established in undergraduate nursing education [9,4]. While critics often refer to classroom LEs as traditional, contrasting the type of teaching that takes place in these settings with more innovative methods [10], this depiction may fail to fairly represent the breadth of teaching methods that may be utilized and to fully depict the modern ‘classroom’.
Function

The classroom LE remains the mainstay of most undergraduate nursing educational programs [11,12]. This environment has a well-established history of utilization of lecture format teaching, providing a venue for large amounts of information to be delivered by teachers to students through one-way communication [11]. Lecture format aligns with a teacher-centered style of teaching, that has distinct teacher and learner roles in that the teacher is considered the expert and the student is considered the recipient of knowledge [5,13]. The traditional lecture has been critiqued for the unidirectional flow of information in which students are expected to listen, take notes, memorize, and later recall information [9,13].

Strengths

Classroom LEs are well suited to teaching by lecture, which allows for the delivery of large amounts of content in a short period of time while conveying facts, clarifying difficult concepts, or organizing thinking about the science of nursing or nursing knowledge [10,5,9,12]. In this capacity, the classroom LE has been considered highly efficient in terms of financial costs and human resources when delivering large amounts of content that is now considered requisite knowledge for undergraduate nursing students [5,14]. The classroom LE has been portrayed as effective in teaching foundational knowledge or critical information required for a particular area of study [5]. Skilled lecturers can organize content into meaningful segments, emphasizing important concepts for knowledge translation. Experienced lecturers will also employ active-learning strategies to engage students through group discussions, use of multimedia resources, and demonstration of enthusiasm for the content [15,16].

Interaction, communication, and teacher responsiveness may be particularly fostered within the face-to-face classroom environment. Communication is interpreted through verbal and non-verbal mechanisms, with most occurring non-verbally, such as with eye contact, facial expression, and affirming gestures that facilitate teacher-student communication [5]. Assessing the degree of student comprehension through non-verbal expression, the teacher can then pace the content delivery in the moment in order to meet student learning needs [15]. Within the classroom, communication has been critiqued as being unidirectional, occurring solely from the teacher to the student [5]. Gruendeman [15] counters this assertion, instead claiming that the classroom can be the site for rich two-way exchanges of communication between teachers and learners. Additionally, Bucklely [17] notes that interpersonal relationships within the classroom LE were identified as important to students in terms of their peer to peer and learner to instructor interactions [17].

The classroom LE may provide an ideal environment for role modelling and coaching of students or facilitating role clarification. Benner et al. [10] recommends that teachers coach students using techniques that lead to students’ own self-discovery. For example, using probing type questions may stimulate students to engage in critical thinking, as higher level processes [10,18] and promote active engagement in classroom discussion. For example, challenged with a realistic clinical problem to solve, small groups of students can come together to learn in a student-led process that focuses on exploring and answering a proposed problem [19,13,20]. As an anticipated outcome of nursing education [1], critical thinking is an essential skill. Classroom LEs are a critical adjunct to practicum settings in engaging students’ acquisition of concepts that can be applied within a variety of contexts.

Weaknesses

A significant issue of classroom LEs is that they are most suited to teaching methods, such as lecture, that may result in information overload due to inadequate analysis and selection of essential topics by teachers [10]. New content is continually injected into the curriculum, while less important content is not removed [10,9,21]. For example, the more recent emphasis on topics such as population health, epidemiology, and genetics means that these foci have now become embedded into undergraduate nursing curriculum in response to the need to meet the mandate of graduating practice-ready nurses [21]. Content laden lectures may cover a wide range of topics in a single class in order to satisfy an instructor that the topic was covered in the curriculum [10], leaving little opportunity for the student to process and absorb the content. With such a breadth of content, the student then needs to discern what is the most immediately relevant, and often learning only the context determined to be on a test or evaluation [10]. Unfortunately, this may result in a tendency to rote memorization that limits higher-level learning processes such as critical thinking or clinical judgment among students [5,22,21].

Some researchers and scholars critique the classroom LE for the lecture format teaching that may prompt a lack of engagement among students and resulting in them passively absorbing knowledge from the teacher or content expert who is viewed as the authority on the subject matter [10,23,5,18]. Bringing active strategies to engage students in classroom environments may be highly useful. Yet Benner et al. suggest that implementing active learning strategies into the traditional classroom LE in which lecture format has been utilized requires considerable thoughtfulness to ensure that games and entertainment do not obscure the seriousness of the nurse’s work.

Teaching strategies used to more actively engage students in classroom LEs have also been critiqued. These may include the use of effective questioning techniques and problem based-learning strategies [5]. Effective questioning is a common technique used in the classroom LE to assess learner comprehension, however, some researchers and scholars claim that teachers frequently ask low level questions, missing the opportunity to stimulate students’ analytical thinking [24]. In this case, it is not the classroom LE that is under critique, but potentially the skill or expertise of the instructor in engaging learners. Problem-based learning is another format of learning in small groups that can take place in the classroom LE. Using this teaching and learning approach, the group is facilitated by an educator who presents students with a realistic problem to analyze and solve. Through this exercise the teacher typically guides the group with skillful questions, especially if the group fails to progress [5]. Critics of this approach within the classroom LE suggest that students may become over-reliant on the teacher to continually provide prompting questions, to the extent the students wait for the next prompt from the teacher rather than fully engaging in a problem-solving process independently [5,19].

The Clinical Learning Environment

The clinical setting is an important LE in undergraduate nursing education, with historical and educational significance [25]. Much of early nursing education took place directly in clinical settings, particularly through hospital schools of nursing. While the shift initially to post-secondary nursing education and ultimately to a baccalaureate entry to practice across much of Canada has brought a greater academic focus to nursing education, clinical LEs and the learning opportunities they afford remain an essential aspect of nursing education.

Function

Clinical learning has been a long held tradition in undergraduate nursing education [5]. It has been viewed as especially significant in strengthening the link between theory and practice [10,6,26,27]. The clinical LE provides students with opportunities to demonstrate an array of psychomotor, cognitive, and relational skills necessary to develop for their future roles in health care [10,5,28,29]. These skills are developed over time as the student practices with increasing independence in the clinical LE. Additionally, role socialization is promoted in the clinical LE, in which the clinical instructor, nurses, and other members of
the health care team demonstrate professionalism, interprofessional practice, effective communication, and higher level thinking [10,28,30]. Observing the clinical instructor role model professional behaviour is a significant aspect in nursing students’ learning professional roles [5]. Importantly, clinical LEs provide undergraduate nursing students with the opportunity to develop relational competencies as mandated by professional bodies [2,31,29,30,31].

In the clinical LE, students are supported by clinical instructors to engage in therapeutic nurse-client relationships [5,6]. Additionally, students are exposed to other team members, creating opportunity to develop competency in interprofessional communication. This is significant in terms of patient safety, because breakdown in communication is often the cause of adverse events [32]. As interprofessional and client-nurse relationships are fundamental to nursing practice and patient outcomes, students require ample opportunities to master these skills in real life situations provided in clinical LEs [33,34].

**Strengths**

Contextual learning offered by the clinical LE affords students with real life learning experiences that are crucial [33]. Although basic knowledge may have been developed in a classroom or skills lab setting, the clinical LE fosters development of psychomotor skills required in more complex clinical situations. This allows students to demonstrate the competencies required for independent practice [30]. Prioritization, critical thinking, and clinical judgment are essential competencies for students to develop in the clinical LE, supporting application of foundational knowledge and higher-level thinking [5,35,30]. Capitalizing on the learning that transpires in the clinical LE, reflection is encouraged as a formal and systematic approach for the student to think about and learn from the clinical experience [36,37]. To support the development of critical thinking in clinical LEs, techniques such as structured reflection encourage students to engage in self-assessment and develop plans for remediation, resulting in a greater knowledge development [30].

**Weaknesses**

As nursing is a practice profession, the clinical practicum is essential in preparing undergraduate nurses with experiential learning to develop psychomotor skills, critical thinking, and clinical judgment [10,6,26]. However, there is a lack of consensus in Canada about the standard number of required clinical hours in a nursing program to achieve such competencies [7]. As such, nursing programs vary in the amount of clinical hours that students are required to complete. Similarly, some jurisdictions permit a percentage of clinical hours to be made up during simulation experiences whereas others do not [38]. Hence, there are inconsistencies in use of clinical LEs across nursing programs [39]. This may present challenges to employers of newly graduated nurses in terms of readiness to practice and the amount of orientation needed for the work environment.

Clinical instructors have a significant responsibility in ensuring that patient safety is always maintained, and that students are able to demonstrate the appropriate skill level to care for their assigned patient(s) [5,6]. However, inconsistent practicum experiences in the clinical LE may occur because of a lack of appropriate patients for student assignments. This unevenness of practical experience may lead to inequitable learning for students within a clinical group [5,6,40]. Early discharge, shorter lengths of stay, and higher acuity patients also may impede learning opportunities in the clinical LE.

The level of nursing practice and teaching experience of clinical instructors may vary considerably, yet each plays a key role in professional development of students in clinical LEs [41,40]. For example, a clinical instructor may have many years of clinical experience, but minimal teaching experience [34]. Also, many demands are made of clinical instructors’ time during clinical, with patient safety being a top priority, followed by student learning and success. To ensure patient safety always is at the forefront, clinical placement settings are requesting smaller clinical groups for direct supervision by clinical instructors [41]. As a result, the availability of the clinical LE for student placements may be limited and increased costs involved in securing additional clinical instructors for the increased number of clinical LEs that are needed for students [6].

**The Simulation Learning Environment**

In a simulation LE, students enact a case scenario, repeat as necessary, and engage in debriefing to meet specific learning outcomes [42-44]. If the student or facilitator identifies any deficiencies during the simulation, there are opportunities for the student to remediate [45]. Significant learning is associated within the scenario and also through the debriefing that follows because of the opportunities for the student to reflect on their own performance and identify strategies to improve their practice [46].

**Function**

The simulation LE is emerging as an essential patient safety initiative to provide contextual experiences for nursing students without harm to patients [47-49]. Use of simulation LEs have been found to be beneficial as a result of many contextual factors related to healthcare and nursing education, including the complexity of our healthcare system, ever-increasing patient acuity, increased use of technology, an impetus for interprofessional education, and increased competition for clinical placements [7,42,50].

The simulation LE is becoming widely used in undergraduate nursing education, and has a number of teaching applications. Simulation typology refers to the classification of different educational methods or equipment used to provide a simulated experience. For example, simulation methodologies may include written simulation cases, three-dimensional models, computer software, standardized patients, partial task trainers, or high-fidelity patient simulators.

Through the use of a broad range of simulation typology, ranging from low fidelity, medium fidelity, high fidelity, standardized patients, virtual, and gaming, all domains of learning can be taught and assessed. The simulation LE also permits students to develop and maintain competencies and critically needed skills in events that are infrequently encountered, often referred to as low frequency high risk events, such as a cardiac arrest [49].

**Strengths**

In simulation LEs, patient safety competencies are strengthened in ways that are less intimidating and more impactful for students [51,43]. Through exposure to scenarios that replicate real world experience in simulation LEs, students are able to develop confidence and competencies in knowledge and skills, leading to increased self-efficacy and self-confidence [52-54]. Additionally, simulation LEs promote stronger critical thinking and clinical judgment among nursing students [55,56]. In-depth reflection following a scenario in a simulation LE is crucial as it promotes self-assessment and fosters self-regulation [57,58]. During this debriefing, the student is guided through a structured reflection that acts to further the effect of the learning experience, leading to higher-level thinking processes [57,36].

One of the emerging strengths of simulation LEs is the opportunity for learners to develop interprofessional practice skills and experiences. It is noteworthy that working in interprofessional teams is one of the five core competencies for entry to practice identified by CASN [1]. In a simulation LE, students learn in a protected environment that supports the development of role clarity for the nurse, while also providing knowledge of the other disciplines and their roles within the health care team [59]. In the simulation LE, there are unique opportunities for the
Comparing and Contrasting the Three LEs

Having provided an overview of the function, strengths, and weaknesses of three key LEs used in undergraduate nursing education (classroom, clinical, simulation), a critical analysis was undertaken through comparison and contrast. In terms of strengths, only in relation to the stimulation of critical thinking were all three LEs identified. The potential for the classroom LE to be used to stimulate critical thinking through application of teaching techniques such as the use of probing questions has been noted [10,18]. Within the clinical LE, competencies such as critical thinking and clinical judgment are fostered [5,35,30]. Finally, within the simulation LE, critical thinking and clinical judgment are promoted both within the scenario itself and through follow-up reflection [57,55,56,36]. Both the classroom LE and the simulation LE were identified as supporting effective teaching of theoretical knowledge. In relation to the classroom LE, large amounts of information and foundational nursing knowledge were cited as most relevant for this teaching environment [10,11,5,9,14,12]. For the simulation LE, both instruction and evaluation of theoretical knowledge were noted as strengths [41]. Both the clinical LE and the simulation LE were identified as promoting confidence, self-efficacy, and competence [51-54,33,43]. Similarly, both LEs were cited as effective in promoting development of necessary psychomotor skills [41,30] and reflection/ self-reflection [57,58,36,30]. Of note, the literature identified the promotion of interpersonal relationships as a potential strength within the classroom and clinical LEs [17,10,5,6,40], while the simulation LE was identified as promoting interprofessional relationships and more broadly interprofessional practice [59]. Finally, the classroom LE was identified as supporting student-centred and interactive learning through the inclusion of elements such as active learning strategies and teacher responsiveness [5,15,16].

In terms of weaknesses, the literature identified that faculty preparation and expertise within the specific LE may pose a challenge. For the classroom LE, ensuing faculty have the required expertise to implement active learning strategies was noted [10]. For the clinical LE, the difference between the necessary expertise in nursing practice and relevant expertise in teaching students in practice settings was highlighted [41,40,34]. Similarly, in the simulation LE, levels of experience and knowledge about simulation pedagogy and current faculty training practices were seen as a weakness [61]. Both classroom and simulation LEs were identified as either being unidimensional or being perceived as such. For the classroom LE, this translates into the perception of an LE that, despite efforts to employ a broader range of teaching strategies than just lecture, promotes teacher-driven learning which may lead to consequences such as information overload and passive learning [10,5,9,24,19,21]. For the simulation LE, this critique relates to the misperception that it is most suited to skills instruction, rather than advanced competencies and a focus on higher level thinking [63,50]. Additionally, the ability to promote critical thinking was called into question for both classroom and simulation LEs [10,23,5,22,19,66,21,18]. Both the clinical LE and simulation LE were identified to be resource intensive, with limited opportunity related to time, cost, and availability [62,6,41,64]. Finally, a weakness of the clinical LE was noted to be inconsistent student experience and a lack of consensus in relation to required hours and placements [5,6,38,40], while the lack of evaluative data for the simulation LE was noted as a weakness [48].

Discussion

While aspects of learning within classroom LEs have been negatively appraised by some educators [10,23,5,13], a review of the literature reveals that classroom LEs are viewed positively by students [10,15,67]. When examining the type of instructional methods most suited to classroom LEs, data suggests that little difference in either student satisfaction or test scores were identified when traditional face-to-face lecture formats and other methods of instruction, such as online
or hybrid format learning were compared [17,23,60,68-71]. However, Herrmann [14] and Price [72] report that active learning strategies within classroom LEs facilitate student engagement and knowledge retention. Buckley [17] reported that students value interpersonal relationships, both with peers and with the course instructor, which positively influenced student satisfaction in the classroom LE.

In order to ensure that classroom LEs are effective, Benner et al. [10] suggest that lectures need to formulate strong linkages between clinical application and classroom theory. Recommendations to enhance the quality of instruction in the classroom LE also include enhancing the quality of the teaching [68]. Therefore, professional development for novice nurse educators, is crucial support enabling their transition into academia [5]. In addition, preparing interesting lectures without over-reliance on electronic slides and integrating meaningful activities will enhance the classroom experience [9]. Importantly, a skilled lecturer is required to guide students through the content [10] so that pertinent information is exchanged between teachers and learners [5].

Clinical LE experiences promote students’ development of psychomotor skills, while fostering critical thinking and the acquisition and application of other nursing knowledge [35]. Kuiper [35] claims that structured reflection in clinical LE experiences can facilitate critical thinking, yet when assessed, little change was noted in cognitive processes. Importantly, the impact of higher level thinking processes on patient outcomes has been questioned [35]. Critical thinking as one of the goals of clinical learning has been measured using the Watson and Glaser Critical Thinking Appraisal (WGCTA) [73]. This widely used tool is a valid and reliable instrument to measure critical thinking in nursing. When students were assessed across the duration of an undergraduate program, researchers found no difference in critical thinking throughout the program. The California Critical Thinking Disposition Inventory (CCTDI), another valid and reliable tool measuring critical thinking, also revealed no positive relationship between CCTDI and student academic performance measured through grade point average, pass rates on the national nursing registration exam, and other standardized test scores [29]. Multiple researchers conclude that critical thinking is an elusive concept to define and difficult to measure [74,29,30].

As noted within the classroom LE, interpersonal relationships particularly with instructors are important to students in clinical LEs [40]. The approach of clinical instructors to the role of clinical teaching can significantly impact the student experience [5,40]. Fundamental to the clinical instructor’s role is modeling professional behaviours, including critical thinking [5]. Conversely, clinical instructor’s lack of knowledge regarding critical thinking has been suggested to be a barrier to students developing critical thinking [5,30].

Simulation has been identified as an active learning strategy in which a controlled environment supports student learning [75,52,42,65]. While an expensive technology, simulation is of benefit in knowledge acquisition, critical thinking, confidence, and student satisfaction [5,45,42,76,77]. While the cost of different high, medium and low fidelity simulators can vary significantly, in general there is consensus that simulation programs are often expensive to set up and run. Howard et al. [42] reported that the cost was justified in view of the increased learning through simulation experiences. Yet, due to cost, many academic institutions are unable to afford a program [65]. Typically structured around as a small group activity, there are often limitations in student access to simulation LEs due to the limited availability of simulators in many programs. While some studies report improved student performance with high fidelity simulation [65], others suggest that a medium fidelity simulator is just as effective in promoting knowledge retention and student satisfaction, while available at a much lower cost [76].

Patient safety competencies are learned both in the classroom and in simulation, although mastery is often evaluated in the clinical practicum. Safety competencies [51,78,59] such as communication, teamwork and identifying safety risks are key priorities across all three LEs. Gaining experience in simulation first can build confidence and competence, which leads to enhanced performance in patient safety competencies [59].

The evidence to support simulation based learning to improve patient outcomes is still emerging [75,41]. However, there is some evidence that students prefer simulation over other teaching and learning methods [55,49] and that they experience increased satisfaction, self-confidence, and clinical judgment as a result of learning in simulation LEs [52,79,43]. Evidence supporting increased self-confidence is described in the simulation literature [80,54]. However, little empirical evidence exists that supports simulation LEs as more effective than other types of LEs. In the absence of robust evaluation that examines the impact of the different LEs on knowledge, behaviours, and patient outcomes, comparative analysis is limited [81,82]. These gaps highlight the need for further research that compares the outcomes and effectiveness of the various LEs along with the variety of methods of instruction employed therein. In particular, areas of student satisfaction, development of student clinical judgment, cost, and faculty implications warrant further investigation.

Conclusion and Recommendations

To achieve positive outcomes in pedagogically sound undergraduate nursing education, a multipronged strategy utilizing classroom, clinical, and simulation LEs is required in order for undergraduate nursing students to achieve the competencies required of a novice practitioner. Each of the LEs reviewed in this paper possesses strengths that uniquely promote the acquisition or demonstration of competencies as set out by the CASN Position Statement on Baccalaureate Nursing Education. It may be argued that some concepts are best taught in a classroom LE, whereas efficiency in delivery nursing knowledge is an asset. Similarly, other concepts, such as those often referred to as high stakes low frequency events, may best align with a simulation LE. A variety of LEs, including the common ones reviewed in this paper (classroom, clinical, simulation) are vital to undergraduate education, yet little evidence is available in the literature to support the ways that each LE is most effective and could be utilized to its full advantage [83].

With emerging evidence that simulation can be safely substituted for up to 50 percent of clinical hours given the same conditions listed in the study, simulation is becoming a solution to experiential learning requirements that previously took place in classroom or clinical environments. However, some students continue to prefer the traditional classroom over simulation experiences. This could be due to the student blending into a classroom setting with varying levels of engagement, whereas, in a simulation-based environment, the student is part of a small group required to perform.

Undergraduate nursing programs must include multiple LEs to meet the diverse learning needs and learning styles of the students, and to prepare them for practice as registered nurses in complex health care environments. The use of classroom, clinical, and simulation LEs all foster development of critical thinking, clinical decision making, and clinical judgment. Although it is important to note the classroom and simulation LEs were also critiqued in relation to promoting critical thinking, potentially related to poor utilization of this LE as opposed to inherent limitations within the environment. Similarly, all three LEs may be negatively impacted by lack of faculty preparation and training. Each LE has unique features that faculty require education and training to use effectively. Graduating practice-ready novice nurses requires a multipronged educational approach. Classroom, simulation, and clinical LEs are essential elements of undergraduate nursing education and complement one another. Clearly, there is a critical need for extensive...
and rigorous research into the relative benefits and weaknesses of all LEs given the mandate for undergraduate education. This important research would be of great interest to undergraduate nursing programs and the education of other healthcare professionals.

References

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