What Matters Most to Students in Simulation-Based Education: Voices from Three Philippine State Universities

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ABSTRACT

Background. Simulation-based education (SBE) has expanded in Philippine health professions programs, particularly among state universities and colleges (SUCs) supported by national and institutional capacity-building initiatives. Despite this growth, limited local evidence describes how Filipino students experience and learn through simulation across varying institutional contexts.

Objective. This study explored undergraduate dentistry, medicine, and nursing students' experiences of SBE in SUCs and examined how simulation influenced their learning and professional development.

Methods. An exploratory-descriptive qualitative study was conducted in three SUCs representing academic programs in which SBE ranged from newly implemented to well integrated. Purposive sampling recruited students with substantive participation in simulation activities. Eight focus group discussions (n = 47) were conducted using a semi-structured guide informed by Kolb's Experiential Learning Theory. Data were analyzed through inductive qualitative content analysis within a constructivist approach, with paired coding, iterative comparison, and team consensus to generate themes. The Consolidated Criteria for Reporting Qualitative Research (COREQ) were followed in the writing of this paper.

Results. Across institutions, students described SBE as a structured, psychologically safe learning space that strengthened clinical reasoning, communication, teamwork, and reflective practice. Authenticity of scenarios, faculty facilitation, and structured debriefing were central to meaningful learning. Differences in institutional resources and program maturity influenced perceived realism and depth of engagement. Students highlighted simulation's role in building confidence and bridging theory to practice within resource-variable contexts.

Conclusions. In Philippine SUCs, SBE supports experiential learning processes that enhance cognitive, affective, and collaborative competencies among undergraduate health professions students. Sustained institutional investment in faculty development, scenario design, and reflective debriefing is essential to ensure equitable and high-quality simulation implementation across diverse public higher education settings.

Keywords: health professions education, experiential learning, dentistry, medicine, nursing, qualitative research, simulation

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INTRODUCTION

Simulation-based education (SBE) is an innovative teaching modality that promotes the development of critical decision-making, psychomotor, and affective skills in safe learning environments. This modality is especially valuable in healthcare professions programs where direct patient interaction presents potential safety risks for students and patients. To maximize learning and safety, simulation activities must follow evidence-based standards and incorporate perspectives of students to shape simulation experiences to better meet their educational needs.[1]

Studies have consistently shown how SBE enhances clinical competence, confidence, and critical thinking across healthcare professions compared to traditional didactics and laboratory skills training.[2-4] Among students in dentistry, medicine, and nursing, SBE has improved procedural skills, learning satisfaction, motivation, and overall skill performance.[5-7] The well-structured and psychologically safe learning environment of simulation also promoted self-directed and meaningful learning.[7]

Despite the growing body of literature on the benefits of SBE, its implementation varies widely, particularly in contexts where the modality is newly implemented. This study explores the experiences and perceptions of students from dentistry, medicine, and nursing programs across three Philippine state universities to better understand how learners engage with and benefit from SBE to inform program improvements.

Simulation Modality in Healthcare Education

Simulation has been extensively used in high-risk healthcare to prevent adverse events and enhance patient safety by preparing learners to manage clinical scenarios in controlled settings. However, integrating SBE into graduate health professions programs also has its challenges. These include limited institutional readiness, inadequate physical infrastructure, and faculty members' unfamiliarity with equipment and simulation as a teaching modality.

While technology plays a substantial role in SBE, the use of simulation as a teaching modality aims to teach specific competencies, not to highlight the use of sophisticated technology.[8] It invests in realism and context fidelity to immerse learners in scenarios that reflect real-life.[9] Nevertheless, issues such as underdeveloped simulation infrastructure, staffing shortages, and lack of long-term planning hinder its sustainability and effectiveness.[10]

Faculty play a crucial role in designing and facilitating high-quality simulation activities. To be effective, simulation faculty need training in scenario development, facilitation, and debriefing. The competence and confidence directly affect student satisfaction, learning outcomes, and engagement.[11,12]

International guidelines, like INACSL, recommend a structured approach centered on pre-briefing, facilitation, professional integrity, and debriefing.[13] The pre-brief sets expectations and orients learners. Facilitation guides learners to progress through the scenario toward the achievement of set learning outcomes. Debriefing allows reflection and feedback that are essential for transferring skills to actual practice.

Learner Engagement in Simulation

Learner engagement is the cornerstone of effective simulation. For learners to fully benefit from the activity, they must temporarily accept the scenario as real through suspension of disbelief or by entering a 'fiction contract.'[14] This allows students to respond authentically, manage human factors, and apply clinical reasoning and skills in real time.

When simulations are well-designed and aligned with learning objectives, student engagement, motivation, and satisfaction are significantly enhanced, while self-esteem, self-determination, and performance improve.[15,16]

Wang and Ji described three dimensions of engagement: reflective engagement, performance engagement, and interactive engagement.[17] Reflective engagement occurs during the pre-brief and debriefing, helping students connect theory to practice. Performance engagement is fostered by realistic scenarios that promote collaboration and leadership development. Interactive engagement is achieved when students lead the scenario and take accountability for their actions, encouraging peer interaction and autonomy.

Despite the growing recognition of simulation-based education (SBE) as an effective pedagogical approach, there remains a paucity of studies examining how undergraduate students from different healthcare professions perceive and experience simulation within their training. Understanding these perspectives is essential for informing the design and implementation of simulation programs that are responsive to learners' needs and contextual realities. This study therefore explores the experiences of undergraduate students in dentistry, medicine, and nursing programs at state universities, examines how participation in simulation-based activities influences their learning, and identifies their recommendations for enhancing the effectiveness and educational value of SBE within their respective curricula.

METHODS

Study Design

An exploratory-descriptive qualitative (EDQ) design was employed to describe the phenomenon from the participants' perspectives.[18] Semi-structured group interviews were conducted to elicit students' experiences and perceptions of engaging in simulation-based learning activities. Kolb's Experiential Learning Theory informed the data collection strategy, recognizing that the learners' concrete experiences during simulation, subsequent reflection, and meaning-making influence overall learning.[19] Accordingly, the interview questions focused on students' overall simulation experiences, their perceived impact on learning, and their insights on how simulation activities could be improved. This design and data collection approach allowed participants to freely

express their views, share experiences, and generate a diverse range of perspectives within a group interaction.

Setting and Sampling

The study was conducted in three state universities in the Philippines – the University of the Philippines Manila (UPM), West Visayas State University (WVSU) in Iloilo, and Mindanao State University – General Santos and Iligan Institute of Technology (MSU-GS and MSU-IIT), or MSU. These institutions were purposely selected to represent the varying levels of SBE implementation, from developing to more established programs, allowing exploration of student perspectives across different institutional contexts.

Dentistry, medicine, and nursing programs were included based on the availability of integration of SBE in course activities. All participating universities are recipients of the Commission on Higher Education (CHED)-funded capacity-building initiative for state colleges and universities in 2022-2023 and were strategically selected for their regional catchment areas and potential to support SBE development in other SUCs.

Purposive sampling was employed, consistent with an exploratory-descriptive qualitative (EDQ) design, to recruit participants who could provide rich, experience-based accounts of SBE engagement. Inclusion criteria were: (1) enrollment in an undergraduate dentistry, medicine, or nursing program; (2) age >18 years; (3) participation in a simulation-based learning activity as a participant, observer, or embedded participant during the current or previous semester; (4) engagement across all simulation phases of pre-brief, facilitation, and debrief; and (5) good academic standing in the course with SBE activities. These criteria ensured that participants had sufficient exposure to simulation to meaningfully reflect on their learning experiences.

A total of 47 students participated in eight focus group discussions. Each FGD comprised 4-7 participants from the same program and university to promote comfortable group dynamics and allow adequate opportunity for all participants to contribute.[20] Maximum variation sampling was used to capture diverse perspectives by ensuring representation across sex, course, year level, and simulation roles. Sampling continued until thematic saturation was achieved at the point when no new codes or insights were generated from successive FGDs. Two additional FGDs were conducted to confirm saturation and enhance the robustness of the findings.

Ethics Approval

The UPM Research Ethics Board (UPM REB) and the WVSU Research Ethics Board (WVSU UREC) granted exemption of the study from full review due to the minimal risk nature of the research (UPMREB 2024-0189-EX, WVSU.URERC-2024.OI_001). The Mindanao State University recognized the exemptions and approved the data collection. All participants provided their informed consent prior to any interviews.

Data Collection

Data were collected from March–June 2024. Analysis occurred concurrently with data collection, allowing refinement of prompts. Triangulation occurred through field notes, analytic memos, and team analysis.

Participants were invited by a member of the research team or the research coordinator of the school through a representative of the class. Once a shortlist of potential participants was provided by the class representatives, the study team sent an invitation containing an overview of the study and a copy of the informed consent form to the students' university email addresses. Upon receiving confirmation of their participation, a schedule was set based on the common preference of the group, and an advance copy of the interview guide was sent. Written informed consent was again secured, along with a short participant profile, before starting any interviews.

The interview guide (Table 1) was pilot-tested and refined after the first FGD to improve clarity. Interviews were audio-recorded using encrypted digital recorders and backed up by password-protected mobile devices with secure cloud backup (University Google Drive).

Interviews of UPM and WVSU participants were held in person, while those with MSU students were held online, via Zoom, due to logistical challenges and participant preference. These were conducted in English, but participants were encouraged to express themselves freely and use their preferred local language or dialect. Each interview was led by two study team members. Each interview was facilitated by a master's- or doctorate-prepared health professions

Table 1. Interview Guide

1. Please describe your experience participating in simulation activities.
How would you describe the teaching strategy and resources used in your SBE session/s?
What was your role in the SBE activity? How did you feel as you participated in the SBE activities throughout the course?
How was your experience with the simulation facilitator?
How did you feel after the simulation?
How would you compare your experience in simulation and traditional teaching activities?
2. Please share your expectations after participating in simulation activities.
What outcomes do you expect to achieve from engaging in simulation?
What do you think are the benefits of having simulation activities in your course?
What do you think are the drawbacks of having simulation activities in your course?
3. Please share your recommendations to maximize your learning from simulation activities.
What allowed you to maximize learning in simulation?
What challenges have you experienced that hindered you from maximizing learning in simulation?

faculty member with qualitative research and interviewing experience, using the semi-structured interview guide. An observer kept field notes to docu-ment non-verbal expressions and other observations. Data collectors belonged to a different profession or university from the participants to minimize any undue bias. All interviews lasted a maximum of 45 minutes. Audio recordings were transcribed verbatim by an external transcriber, and transcripts in local dialects were translated into English in preparation for analysis.

Data Analysis

Data were analyzed using qualitative content analysis (QCA) within a constructivist paradigm, consistent with an exploratory-descriptive qualitative (EDQ) design.[21] QCA was selected to provide a systematic and low-inference description of students' experiences while remaining close to the data, aligning with the study's aim to describe perspectives rather than generate theory or interpret latent meanings.

All transcripts were reviewed for completeness by two authors (JP, JB). An inductive approach was applied, with transcripts coded in iterative cycles by paired study team members (AB and BM, AG and MD, ER and GA, JP and JB). Coding pairs independently reviewed transcripts and accompanying field notes, followed by comparison, discussion, and recoding to enhance consistency. Salient codes were grouped into categories based on conceptual similarity, which were reviewed and refined through team consensus. Two authors who were most familiar with the dataset (JP, JB) synthesized the final themes and subthemes, which were agreed upon by the full study team.

This analytic process promoted transparency, analytic rigor, and consistency while ensuring findings remained grounded in participants' accounts.

Trustworthiness

The criteria of credibility, confirmability, dependability, and transferability were followed throughout the data collection and analysis to ensure trustworthiness in this study.[22] All interviews were audio-recorded, and a third party transcribed the recordings and translated transcripts as needed. Interviewers were scheduled to conduct FGDs in another profession or university to limit any biases. Audit trails and field notes were kept, and member-checking was done to ensure credibility and confirmability. The Consolidated Criteria for Reporting Qualitative Research (COREQ) was followed throughout this paper.[23]

All the study team members are experienced health professions faculty. The lead investigators (JP and SB) are doctorate-prepared nurses, engaged in SBE, and have previous experience in conducting FGDs. MT and BM are health professionals (physicians and dentists, respectively) and have master's degrees in health professions education. AG, AB, MG, and ER are master's-prepared healthcare professionals. The three investigators (JP, AG, MG) lead the simulation laboratories of their respective colleges. JB is a non-faculty researcher working under the SBE study group. The study team members acknowledged their assumptions and preconceived beliefs in SBE and its potential to influence the facilitation of discussions and analysis of data. Credibility was enhanced by having a multi-professional and multi-generational team with varying levels of SBE experience. Data were collected by study team members from a different profession and with assistance from non-faculty observers to minimize bias.

RESULTS

Participant Characteristics

Interviewees had a mean age of 23 (SD = 2.33), with 61.70% were females. Twelve students were from MSU, 17 from UPM, and 18 from WVSU. Table 2.1 presents the distribution of study participants according to their programs and their assumed roles during SBE activities, while Table 2.2 presents the characteristics of individual study participants.

Table 2.1 Participant Distribution according to Degree Program and Roles in Simulation Activity

Program	Frequency N (%)	Roles			
		Learner Participant	Observer	Embedded Participant	Multiple Roles
Dentistry	10 (21.28%)	4	0	3	3
Medicine	19 (40.42%)	0	1	0	18
Nursing	18 (38.30%)	13	0	3	2
Total	**47 (100%)**	**17 (36.17%)**	**1 (2.13%)**	**6 (12.76%)**	**23 (48.94%)**

Table 2.2 Student Participant Characteristics

ID	Program	Age	Sex	Year Level	Simulation Activity Role
001	Medicine	29	Male	5	Learner Participant/Observer
002	Medicine	25	Female	6	Learner Participant/Observer
003	Medicine	26	Female	6	Learner Participant/Observer
004	Medicine	24	Female	5	Learner Participant/Observer

Table 2.2 Student Participant Characteristics *(continued)*

ID	Program	Age	Sex	Year Level	Simulation Activity Role
005	Medicine	26	Female	5	Participant/Observer/Embedded Participant
006	Medicine	26	Female	6	Learner Participant/Observer
007	Medicine	Undisclosed	Female	5	Learner Participant/Observer
008	Medicine	Undisclosed	Male	5	Learner Participant/Observer
009	Medicine	Undisclosed	Female	5	Participant/Observer/Embedded Participant
010	Medicine	Undisclosed	Female	5	Participant/Observer/Embedded Participant
011	Medicine	Undisclosed	Female	5	Learner Participant/Observer
012	Medicine	Undisclosed	Female	5	Learner Participant/Observer
013	Medicine	Undisclosed	Male	5	Learner Participant/Observer
014	Medicine	27	Female	3	Learner Participant/Observer
015	Medicine	25	Male	3	Learner Participant/Observer
016	Medicine	28	Male	3	Observer
017	Medicine	25	Male	3	Learner Participant/Observer
018	Medicine	25	Female	3	Learner Participant/Observer
019	Medicine	26	Male	3	Learner Participant/Observer
020	Nursing	22	Female	3	Learner Participant
021	Nursing	21	Female	3	Learner Participant/Observer
022	Nursing	21	Male	4	Learner Participant/Observer
023	Nursing	22	Female	3	Learner Participant
024	Nursing	21	Male	3	Learner Participant
025	Nursing	22	Female	3	Embedded Participant
026	Nursing	23	Female	3	Embedded Participant
027	Nursing	Undisclosed	Male	4	Learner Participant
028	Nursing	Undisclosed	Female	4	Learner Participant
029	Nursing	Undisclosed	Female	4	Learner Participant
030	Nursing	Undisclosed	Male	4	Learner Participant
031	Nursing	Undisclosed	Male	4	Embedded Participant
032	Nursing	21	Female	3	Learner Participant
033	Nursing	21	Female	3	Learner Participant
034	Nursing	21	Male	3	Learner Participant
035	Nursing	22	Female	4	Learner Participant
036	Nursing	22	Female	4	Learner Participant
037	Nursing	22	Male	4	Learner Participant
038	Dentistry	21	Female	3	Learner Participant
039	Dentistry	21	Female	3	Embedded Participant
040	Dentistry	21	Female	3	Learner Participant
041	Dentistry	21	Male	3	Embedded Participant
042	Dentistry	21	Male	3	Observer/Embedded Participant
043	Dentistry	21	Female	3	Embedded Participant
044	Dentistry	22	Male	4	Learner Participant
045	Dentistry	23	Female	4	Learner Participant
046	Dentistry	24	Female	5	Participant/Observer/Embedded Participant
047	Dentistry	23	Male	5	Participant/Observer/Embedded Participant

Themes

Analysis of the students' responses generated three major themes: (1) High-quality Simulation Activities, (2) Impact of Simulation on Learners and Learning, and (3) Investing in Simulation. Tables 3.1 to 3.3 present the themes, subthemes, their meanings, and quotes that have been translated into English for comprehension without compromising the meaning expressed by the participants.

High-quality Simulation Activities

Students emphasized characteristics of high-quality simulation experiences (Table 3.1). They described engaging simulation activities as those that closely mirrored clinical scenarios, reflecting accurate patient responses, realistic environments, and well-structured scenarios with embedded participants. Immersing in these activities enhanced their learning and sense of preparedness. However, interruptions, disorganization, unclear flow, or an ambiguous role in the activity disrupted the experience and reduced learning effectiveness.

Consistency in simulation structure and flow was repeatedly emphasized. They preferred to assume the role of scenario participant rather than embedded participant or observer because they perceived this role as providing richer learning opportunities. Students valued the inclusion of prebrief and debriefing and stressed the importance of competent faculty who could design and facilitate smooth and cohesive sessions. Simulations incorporating sound, visual cues, and contextual realism fostered engagement.

Impact of Simulation on the Learners and Learning

Students described simulation as emotionally impactful and pedagogically powerful. Emotions such as anxiety or nervousness contributed to perceived realism, while satisfac-

Table 3.1 High-quality Simulation Activities

Theme 1: High-quality simulation depends on the ability of faculty and facilitators to sustain scenario realism and learner engagement		
Indicators	**Meaning**	**Quotes**
Simulation structure and consistency	Maintain simulation flow using structured simulation phases (pre-brief, facilitation, debrief), clear roles, and limited technological interruptions.	It's better if the faculty states what is expected of us or the things that we should do (during the simulation). *Student 11* There was a time when we didn't know what to do during the simulation. We went straight to the scenario without a clear briefing. So, I think that it's not helpful to participate in a simulation without any briefing on what to expect. *Student 12* During the debriefing, we knew our patient should (have an) established airway. But how could we have possibly established an airway in the first place if there was something wrong with the manikin's structure? I think that's where we got delayed and ran out of time. *Student 5* I agree with their sentiments that there are times when the equipment would break down, and they would disrupt this concept that facilitators would teach - suspension of disbelief. *Student 21*
Facilitator Competence	Have competent faculty who can design realistic scenarios, navigate technology, and facilitate the different phases of simulation.	We have clinical instructors who would sometimes interrupt you when they realize you do something wrong. So, they tell you, "This is the way to do it… You shouldn't do that because…" But some clinical instructors wait until the very end. I remember, he really said, "I won't interrupt you unless it's a life-threatening situation for the patient." This gave me a sense of independence as well, with what you were doing, because they would not interrupt you at every turn that you were doing wrong. Because, of course, if it's your first time, then you would be doing a lot of things wrong. You'll focus. I think it was very helpful that he didn't interrupt that much because it allowed me to focus. *Student 33* During the debriefing, the facilitators really took their time to explain not just what we did wrong in a professional way, but in a non-condescending way. And we did not just stop on the things we did not manage medically, but also as a group: how we should have worked as a group, where we lacked in terms of communication, doing our job as a team leader, or something else. I think it is a more well-rounded form of feedback. *Student 4*
Realism	Ensure fidelity.	We needed that pretend time because that pretend time would, eventually, help us with the real patient. When they ask you to act (as an embedded person), when they ask you to simulate (as a participant), you're assuming suspension of disbelief. You believe that this is happening (and) you believe that this will happen. *Student 21* It's like I'm able to assess my reflexes at the same time. It's as if it were automatic for me to check the vitals. Then, when I saw that the patient was desaturating, I recalled what I needed to do... It feels real, physically, even if I knew he was a manikin, but it felt real to me. *Student 5* I think having someone who is not your classmate pretend to be the patient, and the folks would be nice because there's no sense of familiarity. You would really have to force yourself to interact with someone you don't know. *Student 19*

Table 3.2 Impact of Simulation on the Learner and Learning

Theme 2. Engaging simulation activities generated emotional responses from students and impacted their overall learning		
Indicators	**Meaning**	**Quotes**
Emotional impact	Emotions experienced during simulation add to the scenario's realism and one's self-perception.	It's also very anxiety-inducing when you're doing it because "Oh, am I remembering this properly? Am I doing this skill properly?" And then at the end, you did it! And I think all that anxiety goes away and you're like, "Okay. I'm okay." *Student 36* We couldn't elicit the objectives that our professor wanted us to achieve during the actual simulation. So, we couldn't revive (the patient). So, it was heartbreaking for us too. *Student 11* There are times you feel satisfied and other times that you feel regret, even disappointed with yourself. I felt satisfied when I knew I did things right or the patient didn't expire. But there were also times when I just cried because I was so disappointed and frustrated, and asked myself whether I did what was expected of me. "Why did that happen?" Even though I knew it was a simulation, I was emotionally affected. *Student 12*
Linking learning	Simulation bridges theory and application, preparing students for clinical placement.	It (simulation) really bridges the gap between theory and practice. It puts into action… or enhances understanding of your clinical skills. Also, you get to have like a deeper understanding of theories in this controlled environment. *Student 15* You get to experience what might happen in the clinical setting when you're in a simulation. It will test how well you can apply theory to practice. *Student 34* SBE helps us to respond to failures. If you fail, you just rise repeatedly. Those failures are necessary to learn better for next time. It's a learning curve. *Student 44*
Opportunity to learn from their errors	Simulations create psychologically safe learning environments where students learn from errors without compromising patient safety.	We didn't have simulation activities before, so my first code experience was in the hospital. If we expose students to simulation first, I think it would be better for our mental health. It's also great to have a debriefing after the code in simulation as opposed to what happened when we were Clerks—our debriefing happened when the patient had already died. So mental health-wise, this is better. *Student 3* Even if I make mistakes, there's a chance (for me) to improve. It's a chance to do better the next time… If I made mistakes during the simulation, that could have endangered the patient. I will learn from that and will ensure that I won't make the same mistake when I'm with an actual patient. *Student 36* I think for SBE, you get the chance to be a beginner. That's really the biggest outcome or benefit for me—that you can allow yourself to be an amateur. *Student 45*

tion or a sense of accomplishment in completing the activity and the ability to achieve learning outcomes shaped their self-perception. They viewed simulation activities as a vital link between theoretical learning and clinical application, providing opportunities to apply knowledge and practical thinking and to strengthen collaboration and interpersonal skills during clinical placement.

Well-facilitated sessions were also seen as psychologically safe spaces where the students could make mistakes without fear of harming patients or being judged. This sense of safety enabled risk-taking, peer learning, and personal growth. Students appreciated the freedom to be amateurs, learn from failure, and develop confidence in a supportive environment.

Investing in Simulation

Students underscored the need for sustained investment in human resources to support their SBE programs, including faculty, technicians, patient actors, and other staff. They considered human resources as important as updated and functional equipment, internet connectivity, and simulation space. They noted that limited faculty availability, inadequate facilities, scheduling conflicts, and an already compact curriculum led to inconsistent simulation facilitation and unequal opportunities for students to engage in simulation activities.

Despite these prevailing challenges, students expressed strong support for the broader integration of simulation into the curriculum, particularly in courses with clinical placements. They emphasized that the repeated, structured simulation activities helped build their competence and confidence in caring for actual patients.

DISCUSSION

The findings of this study align closely with existing literature, reinforcing the importance of realism, structure, faculty competence and availability, and resource investment in enhancing the SBE experiences of undergraduate students in healthcare programs.

Kolb's experiential learning cycle provides a robust framework for interpreting this study's findings.[19] Simulation activities offered students concrete experiences through

Table 3.3 Investing in Simulation

Theme 3: Maximizing the yield from simulation requires investments beyond equipment		
Indicators	**Meaning**	**Quotes**
Human resources	Investment in an adequate number of competent faculty and staff needs equal focus as equipment acquisition.	Provide the students and the instructors, and the university or the institution with the resources to properly implement SBE. *Student 34* It's more about the college needing to allocate time for the training of manikin operators and doctors. *Student 18* There should be more discussions among the faculty to standardize (simulation)... Sometimes it felt like there was a lack of coordination between the clinical instructors, where they don't have the same line of thought when it comes to certain procedures, certain actions that should be done. *Student 36*
Curricular integration	Integration of simulation sessions across clinical courses maximizes the advantages of this learning modality.	Simulation needs to be integrated into the curriculum. There should be consistency in scheduling, too. And there should be available SBE-trained faculty and experts. *Student 13* They need to make sure that simulation-based education is integrated across all subjects in our curriculum. Because in our experience, we have simulation-based education, but our problem is the schedule. *Student 27*
Physical and Technological Facilities	Beyond manikins, students recognize the need to invest in spaces, supplies, and connectivity to ensure seamless SBE implementation.	One of the biggest challenges is the proportion of students to the facilities of our college. So, for example, we are almost 500 students, but the number of classrooms, as well as the resources in our skills laboratory, is not enough to provide the optimal SBE experience for each student. *Student 32* I think our sense of immersion breaks sometimes, like when we had to push the baby manually when our [Maternity Manikin] broke down. Since we had to push manually, we couldn't gauge how the birthing process was supposed to happen. We asked ourselves, "How does resistance feel anyway?" *Student 21* Ma'am, our poor internet connectivity! (Laughs). I mean, it's a shame that we have a 15 million manikin and a couple thousand-peso internet connectivity isn't working... I feel that it's such a shame if the equipment, manikin, and communication tech aren't connecting when we have them available. *Student 19*

realistic patient responses, environmental fidelity, and scenario immersion. Structured pre-brief and debriefing facilitated reflective observation, enabling learners to process emotions, mistakes, and successes in psychologically safe spaces. These reflections informed abstract conceptualization where students connected simulation encounters to theoretical knowledge and clinical reasoning. Finally, repeated exposure and opportunities to fail safely encouraged active experimentation, allowing learners to refine communication, diagnostic, and procedural skills before engaging with real patients.

This alignment echoes Wijnen-Meijer et al., who demonstrated that linking real experiences, case-based discussions, and simulation operationalizes Kolb's cycle in healthcare education.[19] Similarly, this study aligns with literature that learner engagement in simulation is characterized by cycles of emotional investment, reflection, and skill application, reinforcing Kolb's iterative model.[24] Thus, SBE not only complements but concretizes Kolb's theory, bridging classroom knowledge with clinical practice in a dynamic, learner-centered manner.

While the findings are context-specific to the Philippine state universities, our study resonates with broader global literature on SBE. The emphasis on realism, structured facilitation, and psychological safety reflects universal principles of effective simulation.[2,25] However, challenges such as uneven access to facilities, faculty, and scheduling highlight systemic barriers common in resource-constrained settings. These insights may be transferable to other public universities and low- to middle-income countries (LMICs), where institutional maturity and resource variability shape learner expectations. Conversely, private institutions or advanced centers may present different dynamics, suggesting that transferability is greatest in comparable contexts of limited resources and evolving SBE integration.

From the learners' standpoint, this study advances simulation research by foregrounding the emotional dimensions of learning (anxiety, disappointment, satisfaction, and resilience) as integral to learner engagement and skill acquisition. This underscores the importance of psychological safety and balanced challenge, affirming that even discomfort and mistakes contribute to growth when framed within supportive facilitation.[8,10,19] This is consistent with Madsgaard et al., who emphasized facilitators' strategies to accommodate nursing students' emotions and establish psychological safety.[27]

For Philippine nursing education, the findings highlight simulation as a transformative pedagogical tool that strengthens readiness for high-risk tasks, fosters reflective practice, and enhances interprofessional collaboration. By framing the learner perspectives within the realities of public

universities, our study contributes to the discourse on equity in health professions education. We emphasize the need for sustainable faculty development, infrastructure investment, and culturally responsive scenario design. This learner-centered evidence enriches the national conversation on how simulation can be scaled and adapted to strengthen nursing curricula, particularly in LMIC contexts where clinical exposure and faculty supervision may be limited.

Recent studies have shown that clinical virtual simulation improves knowledge and self-confidence among nursing students and highlights simulation's ability to bridge theory into practice among medical students.[24,27,28] In dentistry, simulation was found to enhance communication and procedural skills.[26,29] Collectively, these findings affirm that simulation fosters reflective, skill-integrated learning that supports student transition from classroom to clinical care.

Finally, the local context emphasizes the potential of simulation to democratize access to quality training. As health professions education increasingly integrates SBE, it can catalyze innovation and help prepare graduates for global health challenges while remaining sensitive to local cultural and resource realities. Further research should explore longitudinal outcomes such as performance metrics, resilience development, and cost-benefit analyses to further establish simulation's role in advancing health professions education in the country.

Strengths and Limitations

This study contributes a learner-centered perspective from diverse undergraduate healthcare programs across state universities in the Philippines. Despite its reliance on self-reported perceptions that may be influenced by participant biases, measures were incorporated into sampling, data collection, and analysis to mitigate bias. Including perspectives from varied programs and universities through a qualitative approach supported the study aim of capturing the views of primary stakeholders. The methodological rigor employed by drawing on content analysis, naturalistic inquiry, and adherence to COREQ guidelines supports the trustworthiness of findings while acknowledging limitations inherent in self-reported perceptions.[21-23] As the institutions strengthen the SBE programs, future research should explore longitudinal outcomes like student performance and cost-benefit analyses of program investments.

CONCLUSION

The study sought to explore the experiences and perceptions of students enrolled in under-graduate dentistry, medicine, and nursing programs. Three state universities participated in the study with 10 students from Dentistry, 19 from Medicine, and 18 from Nursing. The degree of SBE implementation and curricular integration varied across universities and programs. Students also assumed varied roles in SBE activities. The application of structured simulation phases of pre-brief, facilitation, and debriefing also varied.

The study confirms established principles of effective simulation activities: realism, structured facilitation, psychological safety, and adequate resources. Context-specific findings, such as uneven access and resource constraints, underscore systemic challenges recognized in the literature. Core simulation elements of pre-brief, skilled facilitation, and debriefing were perceived to enhance learner engagement. Investing in sustainable faculty and staff development, infrastructure, and interprofessional design will help ensure SBE fulfills its promise as a transformative tool in health professions education.

This study highlights what matters most to students in simulation-based education across three Philippine state universities, offering learner-centered insights that extend current SBE literature. While many principles of effective simulation are well established globally, this study contributes context-specific findings from an LMIC setting where resource variability, program maturity, and faculty capacity shape student expectations. Students emphasized the critical role of pre-simulation preparation—both psychological and academic—as a foundation for confidence and engagement, an area less emphasized in prior work. They also described the emotional demands of simulation, including feelings of exposure and pressure, underscoring the need for consistent facilitation, clear expectations, and supportive learning environments. By drawing on perspectives from multiple programs and institutions, the study offers a broader cross-institutional understanding of student priorities in SBE. These insights support the refinement of faculty development, prebriefing practices, and scenario design to better align with learner needs in resource-constrained contexts.

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Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Declaration

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