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Beyond the simulator: a qualitative photo-elicitation study of Simulation-to-Practice Decoupling in newly graduated nurses' high-fidelity simulation experiences

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Abstract

Background: Newly graduated nurses face a well-documented transition shock into practice. High-fidelity simulation (HFS) is widely assumed to ease this transition, yet the evidence remains equivocal, and recent scholarship suggests that the way HFS is designed may paradoxically undermine its own goal: realism of equipment does not equate to realism of cognition, affect, or moral experience. The mechanisms through which HFS shapes—rather than trains—the early-career nurse remain under-theorised. This study examined those mechanisms from the nurses' own perspective and articulated the construct of Simulation-to-Practice Decoupling (SPD), the systematic gap between the performed competence that HFS cultivates and the adaptive competence that clinical practice demands.

Methods: A qualitative photo-elicitation study informed by Interpretative Phenomenological Analysis was conducted at a tertiary academic medical centre in Beijing, China. Twelve newly graduated nurses (up to three years' experience) from 12 clinical departments photographed their HFS learning environments over a four-week window; the images served as elicitation cues in semi-structured, in-depth interviews (eight by telephone, four by online chat). Data were analysed using a six-step IPA procedure with dual coding, negotiated consensus, member checking, and an audit trail, reported in accordance with the COREQ checklist.

Results: Four superordinate themes emerged: (1) The Performed Self—HFS cultivates a scripted,

monitor-anchored, observer-aware mode of being that satisfies checklists but leaves little imprint on adaptive judgment; (2) The Relational Vacuum—the emotional, cultural, and moral texture of patient encounters collapses into emotionally sterile simulations, leaving empathy without an object; (3) Pedagogical Inversion—debriefing is operationalised as assessment rather than reflection; (4) Threshold Shock and Identity Dissonance—the clinical transition becomes a shock of self rather than of skill. A negative-case analysis showed that the two participants based in units running in-situ simulation 'booster' programmes reported attenuated transition shock.

Conclusions: SPD reframes the 'illusion of preparedness' not as a learner deficiency but as a design consequence of conflating physical fidelity with cognitive, affective, and moral fidelity. Closing the gap requires simulation ecosystems that deliberately engineer ambiguity, embed relational cues, protect formative debriefing, and scaffold integration into practice through in-situ simulation.

Keywords: High-fidelity simulation, nursing education, newly graduated nurses, Simulation-to-Practice Decoupling, photo-elicitation, professional identity

Background

The persistent gap between classroom learning and real-world clinical action is a central, internationally recognised challenge in nursing education. Simulation-based education (SBE) has become the dominant pedagogical response, and high-fidelity simulation (HFS) is widely positioned as the gold standard for building clinical competence before students encounter live patients [1–5]. Recent evidence demonstrates that HFS improves key learning outcomes for nursing students, including clinical decision-making [6], self-confidence and satisfaction [7, 8], and performance in specialised skills such as airway management [9]. HFS has also been shown to enhance self-awareness, empathy, and patient-centred care [10]. While these studies highlight the educational value of HFS, little is known about how newly graduated nurses perceive and translate these simulation-based experiences into real clinical practice, underscoring the need for further exploration.

Two limitations of this evidence base are decisive for the present study. First, outcomes are

predominantly measured immediately after the simulation, leaving the longitudinal question of whether—and how—simulated competence is enacted during the first months of clinical practice largely unanswered [11, 12]. Second, physical realism does not equate to cognitive, emotional, or moral realism: the Healthcare Simulation Dictionary defines high fidelity as "experiences that are extremely realistic and provide a high level of interactivity and realism for the learner" [13], yet emerging scholarship argues that the conditions under which HFS translates—or fails to translate—into clinical capability remain poorly understood [11, 14]. HFS therefore faces a credibility problem precisely when it is implemented in resource-constrained, scripted, or assessment-driven ways; the 2025 update to the INACSL Healthcare Simulation Standards accordingly calls for psychological fidelity to be treated as a design constraint rather than a by-product of equipment investment [15, 16].

In brief, the well-documented barriers to HFS—cost, faculty release time, uneven educator competence, and limited realism for non-technical skills—are now compounded by the rapid diffusion of extended-reality (XR/VR/AR), generative-AI debriefing, and adaptive scenario engines [17, 18]. A 2025 mixed-reality meta-analysis in undergraduate nursing education found reduced anxiety but inconclusive gains in knowledge and skills, alongside challenges of cybersickness, usability, and cost [18]. Crucially, the social and cognitive consequences of these evolving modalities for the early-career nurse's professional identity formation have not been systematically examined [19, 20].

Photo-elicitation interviews (PEIs) offer one route into this under-examined territory. PEIs are a participant-centred, arts-informed method in which photographs produced by participants prompt memory retrieval, affect, and disclosure during interview [21, 22]. When participants themselves capture and select the images, PEIs privilege their own visual field, soften the rigidity of the question-and-answer format, and surface non-declarative, tacit knowledge—the layer where over-scripted simulation may leave its deepest imprint [23–25]. Although PEIs are used across health and social research, their application to nursing-education SBE remains nascent [26–28].

Building on these gaps, the present study pursued three aims: (1) to describe, through newly graduated nurses' own photographs and narratives, what their HFS experience was; (2) to surface

the mechanisms by which current HFS configurations shape—rather than merely train—early-career nurses; and (3) to articulate a candidate theoretical frame for why performed competence in the simulator does not transfer to adaptive competence on the ward. To that end we introduce the construct of Simulation-to-Practice Decoupling (SPD), defined here as the systematic, design- and system-driven gap between the performed competence that HFS currently cultivates and the adaptive, relational, and identity-based competence that clinical practice demands. SPD is deliberately proposed as a candidate construct rather than an established theory: it is intended to be nameable, examinable, and falsifiable. We reasoned that photo-elicitation, by privileging the participant's own visual field of the simulator and the ward, would surface mechanisms that purely verbal interviews tend to elide.

2. Methods

Study Design

This is a qualitative photo-elicitation study combining participant-driven photo elicitation with individual semi-structured interviews, framed within Interpretative Phenomenological Analysis (IPA) [29]. The combination privileges individual depth and idiographic variation—a design rationale especially suited to exploring under-theorized mechanisms in healthcare education [21]. Ethics approval was obtained from the Medical Ethics Committee of Peking University First Hospital (Beijing, China; IRB No. 2023YJ28), and the study is reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) 32-item checklist [30]. The study was conducted in accordance with the Declaration of Helsinki [31].

Participants

We recruited registered nurses within the first three years of post-registration practice at a tertiary academic medical centre in Beijing, China. We define 'newly graduated nurse' operationally as a registered nurse who has completed pre-licensure education and has no more than three years of post-registration clinical experience. This window deliberately extends beyond the conventional 12-month transition period, and rests on two complementary frameworks. Benner's [32] novice-to-expert model locates such nurses at the 'advanced beginner' stage, at which rule-governed performance still predominates and situated judgment is only

beginning to form; Duchscher's [33] transition-shock theory shows that role adaptation is not confined to the first year, unfolding across 'doing' and 'being' phases that may extend beyond 18 months [34]. Because the phenomenon of interest concerns the delayed enactment of simulated competence in practice, we recruited across the full transition arc (0.5-2.5 years) rather than restricting the sample to the immediate post-graduation period. Participants were aged 21-29 years. The first author (ZY), a Master's-prepared registered nurse with formal qualitative-research training and substantial prior experience in simulation-based nursing education, contacted clinical-nursing-education course coordinators and introduced the study; coordinators identified nurses who were actively engaged in post-employment HFS, irrespective of department.

From an initial pool of 20 screened nurses, we used maximum-variation purposive sampling [35] to select participants across educational level (Junior College diploma, Bachelor's, Master's), gender, age, and department type. We deliberately balanced special units (intensive care, emergency, obstetrics) against general medical and surgical wards, and monitored gender and educational representation throughout recruitment. The final analytic sample (n = 12) comprised seven women and five men; six participants held a Bachelor's degree, three a Master's degree, and three a Junior College diploma; and they were distributed across 12 clinical departments (Table 2). All participants had experienced at least one HFS training cycle in the preceding six months. Seven of the 20 invited nurses did not participate, for reasons that included clinical scheduling conflicts, insufficient recent HFS exposure, job transfer or resignation, privacy concerns about submitting personal photographs, perceived inadequacy of personal experience with HFS, family emergencies, and concerns about the time commitment.

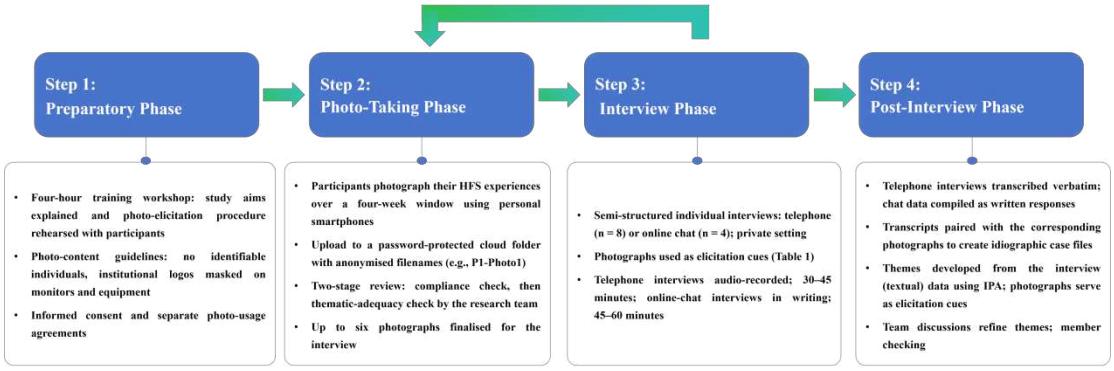
Because participants were drawn from different clinical specialties, we treated the sample as a maximum-variation purposive cohort rather than a representative one. In IPA the analytic aim is idiographic depth and the examination of convergence and divergence across carefully selected cases, not statistical comparability between subgroups [29, 36]. Departmental variation was therefore recruited deliberately, to test whether the mechanisms of interest recurred across clinical contexts rather than to compare specialties with one another. To make this analytic logic transparent, the Results section reports how many participants contributed to each theme, and we explicitly flag any theme whose evidentiary base is narrower than its label implies. The

rationale for the final sample size is addressed under Data Analysis.

Photo-elicitation Process

Data were collected from August to December 2024 using a four-phase PEI framework (preparatory, photo-taking, interview, and post-interview phases) [25] adapted to nursing-SBE (Fig. 1). The first author (ZY) led the first three phases; the post-interview phase was conducted jointly with the full research team. We adhered to Harper's recommendation that researchers and participants co-construct meaning around participant-produced images rather than treating photographs as neutral data [22].

Fig. 1 Summary of the PEI data collection procedure as adopted in this study



Notes: If a submission did not adequately cover the focal experiences, the participant was invited to supplement with one or two additional photographs within two days (loop above).

Prior to data collection, we organised a four-hour training workshop at which the study aims were explained, the ethical boundaries of photography were clarified, and the PEI procedure was rehearsed; participant feedback was used to refine the interview guide (for example, to specify that manikins and equipment could appear, but that no patient or staff member should be identifiable). Following the workshop, the participant information sheet, consent form, and PEI instructions were distributed electronically. Participants who provided informed consent were given a dedicated four-week window during which to capture photographs of their HFS experiences using personal smartphones. Ethical boundaries prohibited identifiable patient images, identifiable colleagues, clinical-floor images, or institutional logos on manikins or equipment (any required masking was performed by participants under instruction). Photographs were uploaded to a password-protected cloud folder using anonymised filenames (for example, P1-Photo1). We deliberately did not supply study cameras, to minimise

participation barriers and to keep the photographic register close to participants' everyday visual practice.

Photograph selection was participant-driven but subject to a documented two-stage review. Participants first shortlisted approximately ten representative photographs and then submitted a final selection of up to six for the interview; the cap balances depth (a richer narrative per image) against interview length and participant burden, and is consistent with methodological guidance that four to six images per interview optimise elicitation quality [21, 23]. Before each interview, the research team conducted a two-round review of the submitted images: (1) a compliance check for prohibited content, and (2) a thematic-adequacy check of whether the image meaningfully reflected HFS experience. Where a submission did not adequately cover the focal experiences, the participant was invited to supplement with one or two additional photographs within two days. The research team never substituted or re-photographed images on a participant's behalf, and any image excluded at the compliance stage was excluded solely on ethical grounds, with the participant informed of the reason. Eligible participants signed a separate Photo Usage Consent Form (Additional file 1) permitting anonymised academic use.

Photographic data were treated as a second data stream alongside interview talk. Saturation of the photographic corpus was judged pragmatically: by the final four participants, newly submitted images reproduced content and composition categories already represented in the corpus (for example, monitor-centred shots, manikin close-ups, and equipment set-ups) and elicited no new interpretive categories. Recurring visual patterns were evident across participants, most conspicuously a dominance of technology-centred images (monitors, pumps, and equipment) over images of people or interaction; this pattern independently corroborated the interview narrative of technology-dependent decision-making (Fig. 2). Where a participant's photographs and verbal account diverged, we recorded the divergence as analytic material rather than resolving it in favour of either source.

The photographs served throughout as elicitation cues rather than as objects of separate visual analysis; no formal visual-semiotic coding was performed.

Semi-structured interviews were conducted by telephone (n = 8) or by online chat (n = 4),

192 according to participant preference, and each lasted 30-45 minutes by telephone or involved
193 45-60 minutes of asynchronous written exchange by chat. Interviews began with a general
194 exploration of the participant's HFS learning context, followed by photo-elicited discussion
195 guided by the topic questions in Table 1: 'Why did you choose this photo?', 'What HFS task were
196 you doing when it was taken?', and 'What do you feel when looking back at this photo?'. Active
197 listening, probing, and silence-as-elicitation techniques were used. Participants are identified
198 throughout by numeric pseudonyms (P1–P12); telephone interviews were audio-recorded and
199 transcribed verbatim. The first author then paired each transcript with the corresponding
200 photographs to create idiographic case files, and kept reflexive memos immediately after each
201 interview to capture contextual and emotional elements.

202 Table 1 Topic guide for interviews

a.	Why did you choose this photo? Please also share what HFS task (e.g., scenario practice, debriefing) you were doing when it was taken.
b.	How do you feel when looking back at this photo? Does it remind you of any specific gains or troubles you had during this HFS experience?
c.	What does this photo mean to your HFS learning? For example, does it reflect your feelings about HFS's help with skill improvement or its limitations?
d.	How does the HFS scene in this photo differ from your real clinical work ? Are there any HFS-related issues that bothered you?
e.	Please add anything else you want to share about this HFS experience.

203 For telephone interviews, participants uploaded their selected photographs in advance, and the
204 interviewer displayed them on screen and referred to each image explicitly by its
205 participant-assigned label (for example, 'photo 3') while inviting the participant to describe what
206 it showed, because interviewer and participant could not view the images together. Non-verbal
207 information was captured or compensated for in three ways: audible paralinguistic cues (pauses,
208 sighs, laughter, changes in tempo) were noted in the transcript; the interviewer verbalised and
209 checked interpretations of affect (for example, 'it sounds as though that still feels
210 uncomfortable-is that right?'); and participants were invited to describe embodied and spatial

details in words. For the four online-chat participants, PEI was conducted asynchronously via a secure institutional platform: participants uploaded their photographs and then wrote responses to the prompts in continuous prose (range 380-1,940 words). Although chat-based PEI sacrifices paralinguistic cues, it permitted reflection and composition time, a recognised advantage of multimodal qualitative data collection for sensitive topics [37, 38]. In both modes the loss of face-to-face non-verbal information is acknowledged as a limitation. No separate follow-up interviews were conducted; member checking (below) served as the only post-interview contact with participants.

Telephone and chat interviews were scheduled by participants themselves and could be rescheduled once; no interview required a repeat session to reach sufficient depth.

Data analysis

We analysed the data using Interpretative Phenomenological Analysis (IPA) [29, 36] with a six-step iterative procedure: (1) repeated immersion in transcript and photograph pairs; (2) initial noting of descriptive, linguistic, and conceptual content for each case; (3) development of emergent themes per case; (4) search for connections across emergent themes; (5) cross-case master-theme construction; and (6) production of the final thematic map. Each researcher was first allocated 2–3 idiographic cases for independent analysis. The lead analyst (ZY) then re-read every transcript and reviewed every photograph with the emerging master list to ensure analytic coherence. Two researchers (SX and KL) independently coded a 25% subsample to explore intersubjective alignment; discrepancies were resolved through negotiated consensus (rather than inter-rater reliability statistics, which IPA explicitly rejects on epistemological grounds). Member checking was conducted by sending a one-page plain-language summary of the draft themes to each participant and inviting written feedback; 9 of 12 participants responded, and minor refinements to theme language and one revision of a subtheme were adopted. An audit trail of coding decisions, theme iterations, and reflexive memos was preserved. The online-chat data were coded after the interview transcripts had yielded a stable theme structure but were deliberately held open to the possibility of new themes; no new themes emerged from the chat data, and the existing structure was retained verbatim.

Sample size was determined by the logic of IPA rather than by a target number. IPA studies prioritise depth of idiographic analysis and typically work with small, purposively selected samples; published guidance recommends approximately 3-6 participants for single-case designs and around 6-15 for multi-case studies of this kind [29, 36]. Our target of 12-16 participants was therefore set a priori, and recruitment continued until data saturation was reached, defined as the point at which three consecutive interviews yielded no new themes or subthemes. Saturation was reached at 13 participants, and recruitment was then closed; one of these 13 participants was subsequently excluded because of incomplete photograph submission and interview data, leaving 12 participants in the final analysis.

To move from subthemes to superordinate themes we used an explicit abstraction procedure. Emergent themes were first clustered within each case by conceptual similarity; clusters were then compared across cases and retained only where the narratives of at least four participants converged on the same underlying meaning, or where a divergent case illuminated a contrast that clarified the pattern. Each candidate superordinate theme was required to (a) subsume its constituent subthemes without residual contradiction, (b) be supported by data from more than one clinical specialty, and (c) be defensible in the language of the participants themselves, not only in the language of theory. The superordinate labels (the Performed Self, the Relational Vacuum, Pedagogical Inversion, and Identity Dissonance) were then assigned as interpretive names summarising the shared meaning of each cluster. Where a superordinate theme rested on a narrower evidentiary base, this is stated explicitly in the Results.

Strategies to Ensure Rigour

We operationalised trustworthiness against the four criteria of Lincoln and Guba [39] and the wider canon of qualitative nursing research [40]. Credibility was supported by prolonged engagement with the simulation context, investigator triangulation (two researchers independently coded a 25% subsample), member checking (9 of 12 participants responded; minor refinements to theme language and one subtheme revision were adopted), and the use of participants' own photographs as an independent corroborating data stream. Dependability was supported by a documented audit trail of coding decisions, theme iterations, and reflexive memos, and by explicit reporting of the analytic procedure. Confirmability was supported by

maintaining an interpretative journal, by recording where analyst interpretation exceeded the participants' own words, and by reporting negative cases (see the Negative Case Analysis in the Results). Transferability was supported by thick description of the setting, participants, and PEI procedure, and by maximum-variation sampling across departments, education levels, and genders; we make no claim of statistical generalisability. A completed COREQ 32-item checklist is provided as Additional file 2.

Researcher Characteristics and Reflexivity

The research team comprised nurse academics with combined expertise in simulation-based education, qualitative methodology, and clinical nursing. The first author (ZY), who conducted all interviews and led the analysis, is a Master's-prepared registered nurse with formal training in qualitative research and IPA, prior training in qualitative interviewing, and several years' experience as a simulation educator; she therefore occupied an insider position in relation to both the clinical and the simulation context. Two co-authors (KL and SX) are experienced qualitative researchers who provided methodological supervision and independent coding; the remaining co-authors contributed clinical and educational perspective. Insidership facilitated rapport, shared vocabulary, and access, but also risked importing the team's own assumptions about simulation into the analysis. We therefore adopted an explicit reflexive stance: ZY maintained a reflexive journal throughout, documenting her assumptions about what 'good' simulation should look like and how these shifted during analysis; preliminary interpretations were regularly challenged in team meetings; and the team actively sought data that contradicted its emerging reading. The findings should accordingly be read as an interpretation co-constructed between participants and researchers, rather than as a neutral description.

3. Results

Participant Characteristics

Twelve newly graduated nurses constituted the final analytic sample; the recruitment and saturation logic is reported in the Methods. The sample was drawn from 12 clinical departments at a single tertiary academic medical centre in Beijing.

As detailed in Table 2, participants (n = 12) spanned diverse educational backgrounds: six held a Bachelor's degree, three a Master's degree, and three a Junior College diploma. Seven participants were women and five were men. They were distributed across 12 clinical departments, comprising general surgical and medical wards (General Surgery, Cardiology, Respiratory Medicine, Gastroenterology, Urology, Orthopedics, Endocrinology), paediatric and obstetric units, and specialty units (Neurology, Oncology, Emergency Department). Post-registration experience ranged from six months to 2.5 years.

Post-employment training frequency varied, from '1 time/2 months' to '3 times/quarter', with most departments conducting training '2 times/quarter'. Self-rated proficiency in HFS operation ranged from 'Basic' to 'Very proficient'. This distribution is summarised in Table 2.

Themes

Using IPA, we organised participants' experiences into four superordinate themes, each containing two to three subthemes (Table 3). We name these themes after a unifying interpretive concept rather than after a description of content, in keeping with IPA's commitment to analytic rather than purely descriptive interpretation [36]. To make the evidentiary basis of each theme transparent, and to avoid over-weighting any single theme, we report for each theme how many of the 12 participants' narratives are quoted, and we note where a theme rests on a narrower base. Each theme closes with an interpretive note that links its subthemes to the superordinate concept.

Theme 1: The Performed Self — SBE as a Theatre of Competence

This theme captures a phenomenon we label the Performed Self: a mode of being in the simulator in which participants enact a tightly scripted, observer-aware, monitor-anchored version of clinical practice that satisfies checklists yet leaves a thin imprint on adaptive clinical judgment. Narratives from seven of the twelve participants are quoted in this theme, the broadest evidentiary base in our sample; we nevertheless present it alongside the other three themes as one strand of a single pattern rather than as the dominant finding. The theme comprises three subthemes.

1.1 Over-Scripted Clinical Pathways

HFS scenarios, bound by rigid scripts, imposed a false sense of order that doesn’t align with real-world clinical complexity. This scripted nature stifled the development of adaptive clinical judgment.

Predictable Clinical Pathways: HFS scenarios often followed predefined paths. One nurse (P5) reflected that the scenario 'felt like acting in a scripted play, where my lines and the outcome were already decided'; when a real patient deteriorated unexpectedly, 'that script fell apart, and I felt lost.' Navigating predefined paths does not equip nurses for unscripted deterioration.

Absence of Unscripted Nuances: Real clinical settings are filled with ambiguous situations that HFS does not reproduce. One nurse (P8) recalled receiving 'a verbal order from a busy resident that was ambiguous and sounded risky. I froze because we never practised how to professionally question or clarify a questionable order.' Without exposure to such unscripted nuance, nurses struggle to respond when it arises on the ward.

1.2 Technology-Dependent Decision-Making

HFS’s heavy reliance on simulation technology could hinder the development of independent clinical decision-making and basic assessment skills, creating a dangerous dependence on tech cues.

Cue-Driven, Not Clinically-Driven, Decisions: Nurses often privileged technology over holistic assessment. One nurse (P3) described 'staring at the ECG monitor, chasing numbers, instead of looking at the patient... I was treating the screen, not the person', and missed 'subtle signs like their anxiety or skin colour changes that the monitor couldn't show me.'

Cognitive Freeze Upon Technical Failure: When simulation technology failed, learning halted. One participant (P7) recalled that when the manikin's lung sounds stopped working, 'our entire team just stopped... our clinical reasoning froze too.' This dependence on device cues is a vulnerability wherever equipment malfunctions.

Erosion of Low-Tech Assessment Skills: Over-reliance on simulation technology displaced basic assessment. One nurse (P1) admitted, 'I was so used to relying on the pulse oximeter that I completely forgot to palpate a patient's radial pulse.' Palpation and other fundamental skills were neglected whenever monitoring devices were available.

1.3 Assessment-Driven Performance

HFS, often structured around checklists and instructor evaluation, could turn learning into a

performance for assessment rather than a genuine pursuit of clinical competence.

Learning for the Checklist: Assessment criteria overshadowed deep learning. One nurse (P10) explained that the pressure to perform against the rubric meant he 'memorised checklist items to meet assessment criteria' rather than reaching 'a deep understanding of the clinical concepts'. In a paediatric fever-management scenario, she recalled ticking steps off a protocol rather than individualising care for the child in front of her.

Strategic Mimicry Over Critical Thinking: There was a tendency to reproduce expected behaviours. One nurse (P11) found herself 'mimicking the "right" answers from previous debriefs instead of voicing my own clinical reasoning, even when I had doubts. It felt safer, but it stunted my critical thinking.'

Interpretive note (Theme 1). Read together, these three subthemes suggest that the Performed Self is better understood as a design consequence than as a learner deficit: scenarios that reward observable, checkable, technically correct performance implicitly encourage a narrow behavioural repertoire. Under the high intrinsic cognitive load of simulation, novices revert to schematic, checklist-mediated reasoning [41]. The Performed Self therefore emerges wherever assessment regime, scenario design, and observer effect converge. Reducing it requires designing for the slow, deliberative knowing characteristic of expert practice [42], not only the fast, automated performance that current scenarios reward.

Theme 2: The Relational Vacuum — Empathy Without an Object

Where Theme 1 interrogated the cognitive shape of simulated practice, this theme addresses its affective and moral shape. We call it the Relational Vacuum: the experience that, however physiologically faithful the manikin, the simulation offers nothing that can be empathised with. The theme is intelligible through Kneebone's conceptual work on authenticity and realism in healthcare simulation [14] and through nursing's scholarship on relational ethics and moral identity [43]. Narratives from five of the twelve participants are quoted in this theme, which we present across three subthemes: relational sterility across patient and team encounters, lack of patient diversity, and suppression of the authentic self. The first two of the original candidate subthemes—emotional sterility and artificial relational dynamics—overlapped extensively in participants' accounts and have therefore been combined.

2.1 Relational Sterility — Patients and Teams

Across both patient and team encounters, the simulated relationships were thinner than those the nurses later met on the ward. Two facets recurred: the absence of any emotional consequence to the simulated encounter, and the absence of the relational complexity—trust-building, hierarchy, and conflict—that structures real care.

Inability to Evoke and Practice Empathy: The simulated environment carried no emotional consequence. One participant (P2) recalled that 'after the manikin died, we just moved on to the next task. There was no silence, no weight to the moment.' Because patient loss is never felt in simulation, nurses have little practice in offering emotional support when it occurs on the ward.

Missing the Language of Non-Verbal Cues: HFS often reduced complex human experience to numbers. One nurse (P9) observed that 'the manikin just lies there', whereas 'a patient in pain might clench their jaw, guard a wound, or have a certain look in their eyes.' She added: 'I learned to ask for a pain score from the sim, but I didn't learn to see the pain in the person.'

Task-Focused Rather Than Relationship-Focused Care: The focus in HFS was on task completion. One nurse (P2) recalled that 'the simulation was about completing a checklist: assess, intervene, document. There was no time built in to just talk to the patient, to build trust.' He became 'proficient at tasks but felt clumsy and insincere when trying to connect with my first real patients.'

Teamwork Without Hierarchy or Conflict: Simulated teamwork lacked real-world complexity. One nurse (P11) explained that 'in sim, we were all students, equals. There was no hierarchy. On the unit, I didn't know how to manage up—how to respectfully suggest a different approach to a senior doctor or handle a conflict with a seasoned colleague.'

2.2 Lack of Patient Diversity

HFS scenarios lacked diversity in patient demographics and cultural backgrounds, limiting nurses' ability to provide culturally competent care.

Lack of Demographic and Cultural Diversity: Simulated patients were homogeneous. One nurse (P5) noted that 'all our simulated patients were cooperative, middle-aged adults', leaving her with 'no framework for how to build rapport with a frightened teenager or how to calmly manage a patient who was refusing care.'

Neglect of Psychosocial and Mental Health Crises: Complex psychosocial issues were oversimplified. One nurse (P12) reflected: 'We never practised de-escalating an agitated patient

or how to talk to someone expressing suicidal thoughts... and we never rehearsed them.' Yet these are among the most challenging moments of clinical work.

2.3 Suppression of the Authentic Self

HFS could suppress the authentic expression of nurses' professional selves, limiting their ability to cope with stress and provide genuine care.

No Outlet for Personal Stress and Moral Distress: There was no space to register distress. One nurse (P2) recalled that 'during a particularly chaotic simulation, I felt completely overwhelmed, but the format demanded I just push through.' Real clinical practice requires nurses to acknowledge and manage such feelings; HFS offered no rehearsal for doing so.

Inauthentic Engagement Under Observation: The presence of observers changed behaviour. One nurse (P9) described how 'the instructors taking notes behind the glass' shifted her focus 'from "What does the patient need?" to "What do the observers want to see?"' This performance-oriented attention can carry over into clinical settings and undermine authentic patient care.

Interpretive note (Theme 2). Read together, the three subthemes suggest that the nurse's clinical affect is learned rather than innate, and that the simulator currently provides little of the emotional and moral learning that clinical practice requires. Where trained simulated patients are used, meta-analytic evidence documents learning gains across cognitive, affective, and psychomotor domains [44]; our data are consistent with those gains but also surface a darker observation: when even basic emotional engagement is absent from simulation, nurses never learn that empathy itself can be practised there. This is one mechanism through which decoupling is enacted—a capability that clinical practice requires is never rehearsed in the safe, formative space of HFS.

Theme 3: Pedagogical Inversion — When Debriefing Becomes Assessment

This theme introduces Pedagogical Inversion, a structural pattern in which the constructivist core of HFS—the debriefing conversation—is inverted from a reflective, learner-centred dialogue into a teacher-centred, assessment-oriented monologue. Narratives from four of the twelve participants are quoted in this theme. The pattern is consistent with debriefing research: where debriefing leans toward the summative, the deep-learning affordances of formative SBE collapse [15]. Beyond the debriefing itself, the inversion extends to resource allocation and educator

development; the theme therefore comprises two subthemes, ineffective debriefing practices and inequitable access combined with the educator competency gap.

3.1 Ineffective Debriefing Practices

Debriefing, a critical component of HFS, often failed to facilitate meaningful learning due to its performance-oriented and one-sided nature.

Instructor Monologue, Not Dialogue: The structure of debriefing was one-sided. One nurse (P10) described the debrief as 'a 15-minute lecture from the instructor recapping the correct protocol.' Effective debriefing should be collaborative dialogue; as delivered, it deprived nurses of reflective discussion and of the chance to learn from one another. Structured post-simulation reflection models demonstrate the learning gains that such monologue forfeits [45].

Performance-Oriented vs. Reflection-Oriented: Debriefing was experienced as appraisal rather than reflection. One nurse (P6) described 'an inquisition focused on what we did wrong against the checklist. I spent the whole time mentally preparing to defend my grade, rather than reflecting openly on why I made certain decisions.'

3.2 Inequitable Access and the Educator Competency Gap

Limited access to simulation resources and uneven distribution of learning opportunities created barriers to effective HFS learning.

The Educator Competency Gap: Instructor facilitation mattered as much as equipment. One nurse (P12) noted that when the manikin had a technical issue, 'the instructor would jump in to fix it immediately... it often felt like we lost the thread of the scenario. I wish they had focused more on facilitating our problem-solving rather than just solving it for us.'

High-Stakes, Low-Exposure Reality: Hands-on exposure was limited. One nurse (P11) noted that with 'eight of us crowded around one manikin, you only got a few minutes of hands-on time.' Low exposure, combined with the high-stakes feeling of being observed by peers, increased anxiety and reduced the learning yield of each session.

Interpretive note (Theme 3). Pedagogical Inversion is not a faculty mistake; it is a design-and-system outcome. When debriefing carries grading consequences, when faculty caseloads prevent proper preparation, and when simulation centres are evaluated by throughput rather than learning gain, debriefing migrates from the constructivist core toward a procedural shell [15]. The 2024–2025 INACSL Standards explicitly require that debriefing be psychologically

safe, learner-centred, and outcome-driven rather than assessment-driven; our findings indicate that in practice these requirements are routinely bypassed. Closing the SPD gap therefore requires redesigning the infrastructure of debriefing—faculty release time, formative-only assessment, post-debriefing peer review, and, where institutional capacity allows, AI-assisted debriefing that protects psychological safety while providing structured feedback [46].

Theme 4: Threshold Shock and Identity Dissonance — The Transition as a Crisis of Self

Theme 4 names what the previous three themes have, in effect, prepared us to see. Drawing on Duchscher's stages of transition shock and on identity theory in professional formation [33, 47], we propose that the early-career nurse's transition is not primarily a skill shock but an identity shock: the Performed Self that worked in the simulator cannot survive the unpredictability, ambiguity, and moral weight of the clinical floor, and the nurse must rapidly assemble a different, more adaptive professional identity. Narratives from five of the twelve participants are quoted in this theme, which comprises three subthemes: overconfidence in clinical abilities, unpreparedness for ethical dilemmas, and erosion of psychological safety.

4.1 Overconfidence in Clinical Abilities

HFS often cultivated an inflated sense of competence that crumbled in clinical settings. Nurses mastered simulated tasks in a controlled environment but lacked the adaptability, time-management, and ambiguity-handling skills needed for real-world care, creating a dangerous “cliff” between simulation success and clinical reality.

Simulation Success vs. Clinical Ineptitude: Nurses excelled in the simulation laboratory but struggled with basic clinical workflow. One nurse (P5) put it bluntly: 'I was a star in the sim lab. On the floor, I couldn't even manage my time to give morning meds. The confidence I built was a house of cards.' Scenarios with clear steps and predictable timelines do not rehearse the chaotic, multi-tasking demands of a real shift.

Intolerance of Ambiguity: Clinical practice thrives on ambiguity, while HFS trains nurses to expect clarity. One nurse (P8) noted that 'in sim, data is clear and presented to you. On the ward, you have to hunt for it, piece it together from messy notes and vague handovers. I wasn't prepared for that detective work.' Without practice in assembling incomplete information, nurses felt overwhelmed by the uncertainty of real care.

4.2 Unpreparedness for Ethical Dilemmas

HFS rarely addressed the ethical dilemmas, resource scarcity, and systemic challenges of clinical practice. Nurses entered the workforce unprepared to advocate for patients, navigate moral distress, or problem-solve in resource-strapped environments—leading to feelings of helplessness and disillusionment.

Moral Distress Unaddressed: Clinical practice is rife with ethical conflict—advocating for patients against hierarchy, addressing spiritual needs, balancing family expectations—which HFS largely ignored. One nurse (P7) observed that 'we never simulated having to advocate for a patient against a senior colleague, or how to handle a family's spiritual needs. These are the moments that define a nurse, and we practised none of them.'

The Shock of Resource Scarcity: HFS provides unlimited, pristine resources, whereas clinical practice does not. One nurse (P1) recalled that 'in sim, you have everything you need. My first day, I spent twenty minutes looking for a working IV pump—something that never happened in simulation.' Unrehearsed scarcity became an additional source of stress at the transition.

4.3 Erosion of Psychological Safety

HFS's focus on assessment, recording, and "perfection" undermined psychological safety—the belief that one can take risks, make mistakes, and learn without harsh judgment. In clinical practice, this lack of safety led to risk-aversion, compliance over innovation, and a focus on "surviving" rather than thriving.

The Spectator Effect: Simulation's observational nature—cameras, instructors, and peers watching—shifted attention from care to flawless performance. One nurse (P4) explained that 'knowing you're being recorded and observed changes everything. You focus on not making a stupid mistake on camera, rather than on the natural flow of care.' This habit of performative attention can persist on the ward.

Culture of Strategic Compliance: To survive debriefs in which mistakes were scrutinised, nurses learned to prioritise compliance over creativity. One nurse (P1) admitted that 'we had a silent agreement: never try a creative solution you're unsure of. Stick to the protocol. The goal was to survive the debrief, not to innovate or learn deeply.'

Interpretive note (Theme 4). Identity dissonance is conceptually distinct from the more commonly named "transition shock" [33]: it does not describe a performance deficit on the ward but a self-concept inconsistency that surfaces when the nurse meets a clinical situation that

contradicts the internalised Performed Self. The phenomenology is striking: participants report second-person pronouns (“I wasn’t really me”), vivid micro-narratives of collapse, and a sustained post-arrival sense of imposterhood. This is consistent with longitudinal research on professional identity formation in nursing [47], but is rarely surfaced in HFS outcome studies, which predominantly measure technical skill. The implication is diagnostic: HFS evaluations that do not include identity-related measures may under-report the mechanism by which SPD produces poor clinical transition.

Negative Case Analysis — Booster-Simulation Units

To test the boundary of our analysis, we deliberately re-examined the two participants whose current clinical units operate a structured in-situ simulation “booster” programme (P9, Gastroenterology; P12, Endocrinology; Table 2). In contrast to the broader pattern of identity dissonance and shock, these two participants’ narratives showed attenuation of the transition gap. They reported that the booster sessions, which deliberately embedded ambiguity, time-pressure, and interprofessional team challenges, allowed them to practise transitions: moving between familiar and unfamiliar clinical problems within a single shift.

P9 described how the booster programme reintroduced the moral and emotional dimensions that initial HFS training had elided: 'In the booster, the patient's daughter was crying and refusing to leave the room. Nobody handed me a script for that... For the first time I had to figure out who I was in front of a real emotional problem, not what the rubric said I should be.' P12, whose endocrinology unit had introduced in-situ booster sessions, described a parallel reduction in cognitive freeze: 'When the monitor failed in the booster, I didn't freeze; I thought, this is part of the scenario now.'

These negative cases do not refute the SPD hypothesis; they refine it, and we read them with the same IPA caution that we apply to the broader sample—as illustrative rather than population-level evidence. Their theoretical value lies in showing that the decoupling is not an inevitable feature of SBE but a product of specific design choices: scenario variability, in-situ rather than off-site delivery, deliberate ambiguity, and the rehearsal of transitions rather than of static protocols. Booster in-situ simulation is therefore an early architectural prototype for closing the gap during the first six to twelve months of practice, and its design dimensions warrant further comparative and longitudinal study.

563 Table 2 Demographic and professional characteristics of the participants (n = 12)

No.	Age (years)	Gender	Education Level	Department	Years of Work Experience	Frequency of HFS Training Post-Employment	Self-Rated Proficiency in HFS Operation
P1	24	Female	Bachelor's Degree	General Surgery	1 year	2 times/quarter	Basic-Proficient
P2	28	Male	Master's Degree	Pediatrics	2 years	1 time/quarter	Proficient
P3	21	Female	Junior College	Obstetrics	6 months	1 time/2 months	Basic
P4	26	Male	Bachelor's Degree	Cardiology	2.5 years	3 times/quarter	Proficient
P5	24	Female	Bachelor's Degree	Oncology	1 year	2 times/2 months	Basic-Proficient
P6	29	Male	Master's Degree	Neurology	2 years	2 times/quarter	Very proficient
P7	23	Female	Junior College	Emergency Department	8 months	3 times/2 months	Basic
P8	25	Male	Bachelor's Degree	Respiratory Medicine	2.5 years	2 times/quarter	Proficient
P9	23	Female	Bachelor's Degree	Gastroenterology	1 year	1 time/quarter	Basic-Proficient
P10	24	Male	Bachelor's Degree	Urology	1.5 years	2 times/2 months	Proficient
P11	24	Female	Junior College	Orthopedics	7 months	1 time/2 months	Basic
P12	28	Female	Master's Degree	Endocrinology	2 years	2 times/quarter	Very proficient

564 Table 3 Superordinate themes, subthemes, and subcategories identified through the IPA analysis

Theme	Subtheme	Subcategories
1. The Performed Self — SBE as a Theatre of Competence	1.1 Over-Scripted Clinical Pathways	• Predictable Clinical Pathways
		• Absence of Unscripted Nuances
	1.2 Technology-Dependent Decision-Making	• Cue-Driven, Not Clinically-Driven, Decisions
		• Cognitive Freeze Upon Technical Failure
		• Erosion of Low-Tech Assessment Skills

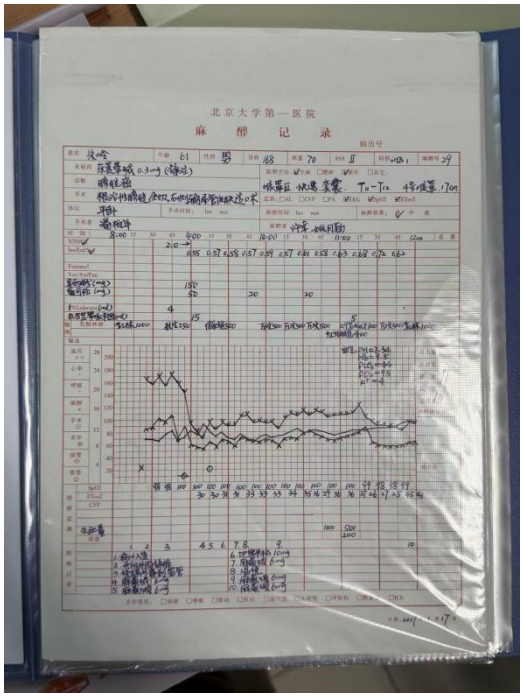
Theme	Subtheme	Subcategories
	1.3 Assessment-Driven Performance	• Learning for the Checklist
		• Strategic Mimicry Over Critical Thinking
2. The Relational Vacuum — Empathy Without an Object	2.1 Relational Sterility — Patients and Teams	• Inability to Evoke and Practice Empathy
		• Missing the Language of Non-Verbal Cues
	2.1 Relational Sterility — Patients and Teams	• Task-Focused Rather Than Relationship-Focused Care
		• Teamwork Without Hierarchy or Conflict
	2.2 Lack of Patient Diversity	• Lack of Demographic and Cultural Diversity
		• Neglect of Psychosocial and Mental Health Crises
	2.3 Suppression of the Authentic Self	• No Outlet for Personal Stress and Moral Distress
		• Inauthentic Engagement Under Observation
3. Pedagogical Inversion — When Debriefing Becomes Assessment	3.1 Ineffective Debriefing Practices	• Instructor Monologue, Not Dialogue
		• Performance-Oriented vs. Reflection-Oriented
	3.2 Inequitable Access and the Educator Competency Gap	• The Educator Competency Gap
		• High-Stakes, Low-Exposure Reality
4. Threshold Shock and Identity Dissonance — The Transition as a Crisis of Self	4.1 Overconfidence in Clinical Abilities	• Simulation Success vs. Clinical Ineptitude
		• Intolerance of Ambiguity
	4.2 Unpreparedness for Ethical Dilemmas	• Moral Distress Unaddressed
		• The Shock of Resource Scarcity
	4.3 Erosion of Psychological	• The "Spectator Effect"

Theme	Subtheme	Subcategories
	Safety	• Culture of Strategic Compliance

565 Fig. 2 Participant photographs and accompanying narrative quotations illustrating the four
566 superordinate themes

Theme	Participant photograph and narrative quotation	
1. The Performed Self — SBE as a Theatre of Competence		"During an emergency simulation, the manikin suddenly froze—no vital signs, no response. We just stood there, staring at each other. The care process completely halted because the technology failed. It made me realize how dependent we'd become on the equipment. In real life, a patient doesn't pause when a monitor breaks. That moment of 'care stops with tech failure' left me unprepared for my first real equipment malfunction on the ward."
		"This photo shows me and the pulse oximeter—I was always glued to the numbers. I forgot to touch the patient, to feel their skin, to really assess them. Once, an instructor asked, 'Aren't you noticing the patient's pallor?' and I hadn't even looked. Simulation trained me to trust monitors, not my own senses. When I finally felt a clinically cold and clammy hand in real practice—despite a normal SpO_2 reading—I

Theme	Participant photograph and narrative quotation	
		understood what simulation had failed to teach me."
2. The Relational Vacuum — Empathy Without an Object		"After the manikin 'died,' we just moved on. There was no grief, no silence, no emotional weight. It felt like turning off a video game. But when my first real patient passed away, I wasn't ready—not for the family's tears, nor for my own numbness. Simulation gave us clinical steps for death, but none of the human aftermath."
		"All our simulated patients were middle-aged, cooperative, and medically straightforward. We never had a teenager, a resistant patient, or someone with complex psychosocial needs. So when I met my first non-compliant diabetic teen in clinicals, I had no framework—not just for clinical management, but for connecting with someone so different from the 'standard' sim patient."

Theme	Participant photograph and narrative quotation	
3. Pedagogical Inversion — When Debriefing Becomes Assessment		“The debriefings felt like a structured classroom procedure. The instructor would lead us through a review of our actions against the standard protocols, explaining what was missed according to the guidelines. While there was some opportunity for us to ask questions, the format was largely instructor-led and focused on aligning our performance with the predefined checklist. It was a useful recap of the correct steps, but it didn't often evolve into a deeper, open dialogue about our clinical reasoning or the emotions behind our decisions. We ended the session knowing the 'what' from the book, but not always exploring the 'why' behind our choices.”
		“With eight of us sharing one manikin, you only got a few minutes of hands-on time. The rest was waiting, watching, and feeling judged by your peers. It created so much anxiety—I was more focused on not embarrassing myself in front of others than on learning to care for the patient.”

Theme	Participant photograph and narrative quotation	
4. Threshold Shock and Identity Dissonance — The Transition as a Crisis of Self		"We never practiced what to do when a family insists on taking a critically ill patient home. So when a son desperately begged me to let his father 'pass away at home,' I was completely stuck. I knew it was against the rules, but I didn't know how to respond or comfort him. The simulation training taught me how to save patients and use all the medical equipment, but it never taught me how to handle this kind of conflict between human feelings and hospital protocols."
		“In simulation, everything was always available—IV pumps, supplies, all perfectly stocked. On my first real shift, I spent 20 minutes hunting for a working IV pump while my patient waited. Simulation never taught me how to problem-solve with limited resources. I felt betrayed by how ‘perfect’ everything had seemed.”

Discussion

In this section we reframe the four themes within a single construct, Simulation-to-Practice Decoupling (SPD). SPD is not a synonym for the familiar 'illusion of preparedness', which is descriptive and learner-centred; it is a design- and system-centred construct describing the systematic gap between the performed competence HFS currently cultivates and the adaptive competence clinical practice demands. We read the Performed Self through Goffman's

front-stage dramaturgy [48] and Eraut's distinction between fast, intuitive and slow, deliberative knowing [42]; the Relational Vacuum through Kneebone's account of authenticity and embodiment in simulation [14]; and Identity Dissonance through transition-shock and professional-formation theory [33, 47].

SPD as a Performed Self (Theme 1). The scripted pathways, monitor-anchored decisions, and assessment-driven performances reported by participants form a single configuration: a front-stage in which the learner optimises for the audience of the simulator rather than for future patients [48]. This is what Bandura's social learning theory would predict when modelled behaviour, environmental feedback, and reinforcement all point to performance criteria rather than adaptive cognition [49]. Eraut [42] makes the same point from a professional-learning perspective: practitioners socialised into fast, intuitive responding, without permission to engage in slow, deliberative knowing, acquire a competence that is brittle and context-bound. Recent theoretical work on adaptive expertise in simulation has reached similar conclusions [11]. Our data extend that observation by showing that the Performed Self is, paradoxically, more rather than less pronounced in a well-resourced tertiary setting, where assessment and audit cultures amplify front-stage behaviour.

SPD as a Relational Vacuum (Theme 2). The second dimension of SPD is the absence of an object of empathic concern. Kneebone's embodied-cognition work argues that physiological fidelity is not the same as situational or relational fidelity [14], and our data confirm this at the level of the nurse's experience. Hybrid simulation with trained simulated patients [50] can close part of the gap, and the available evidence supports that gain [44]. Our data add a starker observation: where the emotional, cultural, and moral registers are systematically absent from a programme's HFS, the learner never discovers that empathy itself is trainable in the simulator.

SPD as Pedagogical Inversion (Theme 3) and Identity Dissonance (Theme 4). Constructivist SBE depends on debriefing [15, 46]. Where debriefing carries grading consequences, it migrates from the constructivist core toward a procedural shell, and the Performed Self is reified through the post-encounter conversation. The fragility produced by this inversion surfaces at the threshold of practice as identity dissonance: the nurse meets a situation that contradicts the internalised Performed Self and must rapidly assemble a different, more adaptive professional identity [33,

47]. Identity dissonance is therefore more than transition shock; it is a self-concept shock, and it is largely invisible to the skill-oriented metrics that dominate current SBE evaluation.

SPD as a candidate construct. SPD is offered as a candidate construct rather than an established theory. It does not claim that HFS fails—the technical benefits of HFS for controlled skills are robust [2, 5]. It claims that the transfer of simulated competence to the adaptive demands of practice is systematically decoupled by the Performed Self, the Relational Vacuum, and Pedagogical Inversion acting together. The construct is in principle falsifiable, and three propositions follow: (P1) the magnitude of identity dissonance at the six-month transition is inversely associated with the amount of deliberate ambiguity built into pre-transition HFS; (P2) it is inversely associated with the amount of in-situ booster simulation available during the first six months of practice; and (P3) it is positively associated with the proportion of debriefing that is summatively graded. The design vocabulary needed to test these propositions now exists, in the 2025 INACSL Standards, in AI-assisted debriefing [46], and in extended-reality hybrid simulation [18].

The contribution of photo-elicitation. Although PEI is increasingly used in health research, its specific analytic yield relative to verbal interviewing is rarely demonstrated. In this study the photographs did more than illustrate: they changed what participants talked about and how. First, they acted as memory anchors for embodied and material details that participants did not volunteer verbally—where they had stood, what they had been looking at, how much equipment had surrounded them; several nurses described looking at a monitor in the photograph before articulating, for the first time, how much of their attention that monitor had absorbed. Second, images redistributed control of the interview: participants selected and sequenced the material, which surfaced topics the topic guide had not anticipated, most notably the emotional absence of the manikin and the physical crowding of the simulation laboratory. Third, images made convergence and divergence visible: the recurring dominance of technology-centred photographs across participants (Fig. 2) independently corroborated the interview narrative of technology-dependent decision-making, whereas participants whose photographs and accounts diverged prompted a more cautious reading. Fourth, photographs provided a concrete, non-threatening route into emotionally sensitive material, allowing nurses to describe moral

discomfort while referring to an image rather than to themselves. These observations are consistent with methodological accounts of PEI as a device for accessing tacit and affective knowledge [21, 22, 24]. The practical implication is that PEI is not merely a variant of the qualitative interview; it is a distinct elicitation strategy whose analytic yield should be reported explicitly, as we have attempted to do here.

Implications for Nursing Practice and Research

Implications for practice and education. Four design moves follow from SPD. First, treat cognitive, affective, and moral fidelity as primary design constraints rather than by-products of equipment investment. Second, re-author debriefing as a formative, learner-centred, identity-explicit conversation and release faculty from grading duties during it, since graded debriefing is a structural source of strategic compliance. Third, invest in educator development for debriefing craftsmanship—psychological safety [51], advocacy-inquiry technique, and structured feedback—and use hybrid simulation with trained simulated patients as a high-leverage substitute for additional manikin hours [44]. Fourth, extend the SBE continuum into the clinical environment: build an in-situ booster simulation slot into the first six months of practice, and have preceptors rehearse transitions during the first 90 days by assigning patients whose presentation lies just beyond the new nurse's current comfort, followed by brief post-shift debriefings.

Implications for research. SPD points to a concrete research agenda. Longitudinal mixed-methods studies should track identity-related outcomes alongside skill outcomes, drawing on longitudinal approaches to professional identity formation [47] and qualitative follow-up at 3, 6, and 12 months. Comparative studies should test whether SPD-informed designs attenuate identity dissonance relative to conventional programmes. Finally, AI-assisted debriefing warrants its own programme of research, balancing privacy, fidelity, and the pedagogical centrality of the human debriefing conversation.

Taken together, these moves do not require abandoning the technical gains of HFS; they require situating those gains within a deliberate, multi-modal, longitudinal SBE ecosystem. The next decade of simulation research will be defined by whether the profession can treat performed and

adaptive competence as a single continuous developmental arc rather than as two separate endpoints.

Limitations

Several limitations should be acknowledged. First, the study was conducted at a single tertiary academic medical centre in Beijing with 12 participants; although maximum-variation purposive sampling secured departmental, gender, and educational heterogeneity, transferability to other national and cultural contexts—particularly rural, primary-care, or resource-limited settings—remains to be established. Second, departmental heterogeneity, although deliberate, limits comparison between specialties; the cohort was designed for idiographic depth rather than for subgroup analysis. Third, four interviews were conducted by online chat and eight by telephone; neither mode captures face-to-face non-verbal behaviour, and the non-verbal dimensions of practice that were central to the Relational Vacuum may therefore be under-elaborated. Fourth, no follow-up interviews were conducted: member checking was the only post-interview contact, and three of the 12 participants did not respond to it. Fifth, the first author's dual role as a registered nurse and simulation educator creates a positionality issue; insider status facilitated rapport and shared vocabulary but also shaped what participants chose to disclose. Reflexive memos and an interpretative journal were maintained throughout; nevertheless, the findings should be read as interpretive of, rather than independent of, the research team's own experience of simulation-based education.

Conclusion

This study asked what newly graduated nurses do with high-fidelity simulation, not whether they like it. Using participant-driven photo-elicitation and Interpretative Phenomenological Analysis, we identified four superordinate themes—the Performed Self, the Relational Vacuum, Pedagogical Inversion, and Threshold Shock and Identity Dissonance—which we propose constitute a single construct, Simulation-to-Practice Decoupling (SPD). SPD reframes the familiar 'illusion of preparedness' as a design consequence rather than a learner failure, and identifies three mechanisms that decouple simulated from adaptive competence: a front-stage,

audience-shaped Performed Self; a Relational Vacuum in which empathy has no object; and a debriefing culture inverted toward assessment. Closing the gap calls for cognitive, affective, and moral fidelity as primary design constraints, deliberate ambiguity in scenarios, debriefing rewritten as formative and identity-explicit conversation, and a booster simulation slot within the first six months of practice. By naming and operationalising SPD, this study opens a falsifiable research agenda for nursing simulation.

Additional files

Additional file 1: Photo Usage Consent Form used in this study.

Additional file 2: Completed COREQ (Consolidated Criteria for Reporting Qualitative Research) 32-item checklist for this study.

Abbreviations

HFS, High-fidelity simulation; SBE, Simulation-based education; PEI, Photo-elicitation interview; IPA, Interpretative Phenomenological Analysis; SPD, Simulation-to-Practice Decoupling; XR, Extended reality; COREQ, Consolidated Criteria for Reporting Qualitative Research.

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Author contributions

Yu Zhao: Conceptualization, Data curation, Investigation, Methodology, Writing – original draft, Writing – review & editing. Haidan Cheng: Methodology, Resources, Supervision, Writing – review & editing. Shijiao Xu: Data curation, Investigation. Ke Li: Investigation, Methodology. Dan Li: Data curation. Junye Tian: Conceptualization, Resources, Supervision, Writing – review & editing.

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Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the ethical principles of the World Medical Association Declaration of Helsinki. Ethics approval was obtained from the Medical Ethics Committee of Peking University First Hospital (Beijing, China; IRB No. 2023YJ28). All participants provided written informed consent before enrolment, including a separate written Photo Usage Consent Form permitting the anonymised academic use of their photographs, and consent for audio recording of telephone interviews.

Consent for publication

Not applicable. All photographs reproduced in this manuscript were captured by the participants themselves under an ethical protocol that prohibited identifiable images of patients, colleagues, or institutional identifiers, and were used with the participants' written photo-usage consent.

Competing interests

The authors declare no competing interests.

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