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Collaboration, Creativity and Compassion in a Digital Society

Explaining perceptions of simulation in teacher education

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Simulation is established in many initial teacher education (ITE) programs in Australia, and implementations of specific platforms have been widely evaluated. This paper takes a broader approach by combining quantitative and qualitative data drawn from simulation surveys and course evaluation feedback representing students' perspectives of three simulation platforms used in many courses over several years. Through this macro-level approach, it is possible to gauge overall sentiment and to identify core themes in the reasons students offer for their opinions. This is presented alongside staff perspectives, to consider the degree to which staff attitudes align with those of students. Collectively, the results of these analyses inform a two-dimensional framework based on the perceived verisimilitude of simulation platforms and the degree to which they require agency from users. This framework can serve as a tool to support the selection and placement of simulation platforms in terms of when and how they can be best integrated within programs to support practitioner development. A key element in this decision-making process is the recognition of a user's stage of professional development, acknowledging that novice practitioners' perceptions of and readiness for simulation vary depending on their level of expertise.

Keywords: teacher education, simulation, preservice teachers, cognitive load, professional learning

Simulation in initial teacher education

Technologically supported simulation is used in initial teacher education (ITE) for the same reasons as in other disciplines; it offers a controlled, safe context for novice practitioners to practise emerging professional skills (Blannin, 2025; Lindberg & Jonsson, 2023). Simulation enables ITE students to practice specific scenarios without real-world consequences and simultaneously provides educators with data that informs further teaching. Coupled with the rapid acceleration of computing power which has enabled software to simulate complex classroom environments, and AI development which now supports increasingly lifelike interactions and rich feedback, simulation is well positioned as a positive experiential learning element in ITE; and is recognised as such by national authorities such as the Australian Institute for Teaching and School Leadership (AITSL, 2023). However, simulation is not without its limitations, including logistical issues, user acceptance, and the need for high-quality evaluation (Spray et al., 2024). Logistical issues include the institutional resources and ongoing investment required to implement and sustain simulation technologies (Ledger et al., 2022). ITE curricula and assessment closely align with professional standards, making it challenging to effectively deploy "off the shelf" third-party platforms. Other issues relate to equitable access to software, hardware, or physical space, and accessibility in terms of inclusive practice.

This paper focuses on the related, but separate, issue of user experience. We acknowledge some overlap with logistical issues, because barriers in accessing simulation inevitably influence users' attitudes towards it. However, beyond this, students bring their own individual differences and expectations to any learning experience, and these are highly influential in their engagement with and experiences of simulation (Wang et al., 2025). Both perceptions of, and behaviours within, simulated environments are influenced by precursors such as general opinions about technology and pre-existing views about simulation, as well as dispositional attributes (Fossey et al., 2026). Specifically, this paper examines the perspectives of novice practitioners. By definition, a novice learner has less existing knowledge with which to approach new learning, and this may be particularly relevant in simulation environments that can impose significant cognitive load and may not always offer intuitive or immersive experiences. Cognitive load theory may therefore support deeper understanding of user experience (Chernikova et al., 2020; Reedy, 2015). The novice perspective is particularly relevant in terms of evaluation, because novice practitioners, by definition, do not yet possess the experience to consistently recognise the potential value of simulation and are poorly placed to provide accurate judgements of competence (Kruger & Dunning, 1999). This is particularly problematic in terms of

the self-report measures commonly employed in evaluations, which is just one of myriad challenges facing the evaluation of simulation in ITE. It is also difficult to isolate the contribution of specific variables, and often impractical or unethical to randomly allocate control groups. Furthermore, given the intention of simulation to prepare for enacted behaviour, the real test of impact lies in preservice teachers' performance in real classrooms. However, this competence is typically assessed during placement courses that are largely unobserved by university educators. The study reported here is not immune from these challenges. However, by drawing upon data spanning multiple simulation platforms delivered in different ways in different courses over a number of years, it is possible to gain a broader understanding of how students experience simulation within ITE. Staff surveys add an additional layer often absent from such evaluation.

This paper offers a case study of one School of Education in Australia where three simulation technologies have been embedded in ITE programs for several years in or immediately prior to courses with in-person school placements. The institutional context and individual technologies are described in brief here, having been reported previously (Spray et al., 2024). The institution is a regional university in New South Wales with large ITE cohorts. In the first half of 2026 (to June 30), the School of Education had 3,676 ITE students (2,734 EFTSL) including 1,251 commencing students of whom 886 were undergraduates. This cohort has high proportions of students who are first in family (47%), from low-SES backgrounds (25%), living with disabilities (19%) and Aboriginal and Torres Strait Islander (7%). For more detail and comparable data, see Higher Education Statistics (Australian Government Department of Education, 2026). ITE students are enrolled in one of five accredited programs, either a Bachelor of Education in Secondary, Primary, or Early Childhood and Primary teaching, or a Master of Teaching in Secondary or Primary. All these programs include mandatory courses that integrate one or more of three simulation technologies: simSchool, simTeach and the simCave.

Students typically first encounter simSchool, a third-party online platform focused on teacher decision-making (Zibit & Gibson, 2005). Entry costs are low, with ongoing costs based on student numbers. This platform presents users with a virtual on-screen classroom and a lesson to deliver. These scenarios are customisable in terms of student numbers and demographics, and terminology and documentation can be tailored to align with local expectations. Users interact with each scenario via an on-screen interface, and the virtual students behave according to predetermined algorithms. After 15 minutes simulated teaching the system provides automated feedback to inform improvement in the next iteration, with the intention that students repeat scenarios at least three times. Cohort-level data is available to instructors. The online delivery suits this platform to online or hybrid degree programs. However, the relatively complex interface demands a steep user learning curve, and repeating scenarios imposes a significant time burden. Depending on how this platform is embedded in a course, students may be asked to work quite independently with supporting resources but minimal human support. Given that the simulation itself is "driven" entirely by the student's interactions with the software, this places a lot of responsibility on the user.

Shortly after simSchool most students will engage with simTeach[1], because both platforms are integrated in courses immediately prior to students' first in-school placement. Like simSchool, simTeach is a third-party platform in which users interact with avatar students; however, simTeach's mixed-reality design involves in-person participation in a specialised simulation space designed to replicate a school classroom, with desks, chairs and a whiteboard. Cameras and microphones enable the human actor, located elsewhere, to observe the teaching being delivered and respond in real time by controlling and voicing virtual characters projected onto a full-wall screen (Syed et al., 2025). There is initial investment in setting up this simulated classroom, and then ongoing bookings and per-user fees. At this institution, students practise two simulated scenarios. The first is a "micro teach" experience, for which small groups of second year pre-placement students observe each other delivering their own short lessons to five avatar students. The third-year scenario then requires the use of research-based strategies to de-escalate a parent/teacher interaction. Both are supported by human facilitators who provide constructive individual feedback.

[1] simTeach is the institutional name for this platform, which is delivered by Mursion in collaboration with Murdoch University as "simLab," which is derived from "TeachLive," University of Central Florida.

The third platform, the simCave, is a seven metre 360 projection space (Igloo Vision, 2023) used for immersive delivery of primarily in-house audiovisual resources. This means high initial investment, and ongoing maintenance and staff support, but without ongoing per user costs. The simCave has a capacity of 15 people, creating some challenge in scheduling large cohorts. This immersive space allows students to engage easily and naturally with what they see, hear, and sometimes smell and touch, using their physical senses with no technological barriers. In contrast to the other two platforms, users do not control the space at all and there is no two-way interaction, removing any element of student performance or responsibility. Rather, this platform requires significant staff investment in designing, creating and delivering pedagogically innovative sessions that enable students to develop awareness of diverse learning contexts. The two simulations reported on in this study are the Dupin experience (Igloo Vision, 2023) and a PE lesson observation.

It was clear very early that simulation platforms must be customised for each course context, clearly aligned with learning outcomes and carefully assessed (Spray et al., 2024). This paper moves on to provide a broad evaluation of student and staff perspectives of simulation in ITE, drawing upon student voices from 2022 to 2026 and a recent staff survey, all interpreted through the lens of the authors' direct experience. The overarching question driving this paper is, "what characterises student and staff perceptions of simulation in ITE?" This is broken into three sub-questions, with results synthesised to inform broader insights. These questions are:

RQ1 Does the evidence suggest that students value simulation, and is there evidence of improvement in the years following its introduction?
RQ2 What reasons do ITE students cite for their perceptions of simulation?
RQ3 To what extent do staff perspectives align with or differ from those of students?

Findings are then reviewed holistically and interpreted to inform a framework for more effective use of simulation.

Method

This study drew data from multiple surveys (Table 1), which were either conducted centrally by the institution, in participating courses, or as standalone research. Student perspectives of all three simulation platforms were extracted from course evaluation data under Quality Assurance from the human ethics committee (QA371). Quality assurance also covered evaluation of simSchool in courses 2023-2026 (QA306), and of simCave experiences (QA312, QA331). The overarching evaluation of simulation in ITE, including the staff survey, had full ethics approval (HREC-2025-0265). It is important to acknowledge the direct involvement of the authors, who have worked together to design, deliver and evaluate these technologies over the last five years, and bring this expertise to the analysis and interpretation of these data. However, all data was sourced from anonymous online surveys, and analysis was conducted primarily by the first author, who did not lead or teach in the courses from which the bulk of these data derive.

Table 1.
Overview of datasets representing perspectives of simulation 2022-2026

Dataset	Date range	Number of courses	Number of data points
simSchool CES data	2022-2026	5	227 comments
simTeach CES data	2023-2026	8	95 comments
simCave student surveys	2023 & 2024	3	66 complete responses
simCave staff surveys	2024	1	6 complete responses
Staff simulation in ITE survey	2026	n/a	14 complete responses

Course Evaluation Surveys (CES) are centrally administered voluntary student surveys that ask students to rate various elements of a course and its teaching and invite comments about the best aspects and areas to improve. Responses are anonymous, meaning that it is not possible to connect these data with demographic information or to track individuals across courses. However, they do offer broad insights into issues that

student cohorts identify as relevant. Qualitative comments were exported for all simSchool courses for the years in which they utilised simSchool, giving a total of 2,215 comments. An Excel formula extracted 266 comments containing "sim" [(=COUNTIF(Dx, "*sim*")]. Manual review excluded those not actually addressing simulation, e.g., including "simply," leaving 254 comments for analysis. The same process was followed for the eight placement courses utilising simTeach, generating a further 909 comments of which 95 mentioned simulations. CES data for simCave courses were also checked, but only one relevant comment was identified so these data were not processed for analysis. simCave took longer to be established due to the need to develop in-house resources, and the scale of its use has been smaller than the other two platforms. Voluntary evaluation surveys were conducted in 2023 for the Dupin project (QA312), which engaged with Indigenous knowledge, and in 2024 for use in two Health and Physical Education courses (QA331), generating 66 complete responses in total. Students were asked to rate their agreement with 10 statements describing their experience, such as "the learning experience was enjoyable" and "the learning experience motivates me to use these pedagogies in my own teaching." While these statements were not designed to reflect one underlying theoretical construct, they nonetheless showed strong internal reliability (Cronbach's alpha .970). Principal Components Analysis identified one factor explaining 79% of the variance, with all items loading >.78. This was used to calculate an overall "rating" for each student. Further details of data and analytic techniques are integrated in the following sections, as relevant to each research question.

Analysis and findings

RQ1 *Does the evidence suggest that students value simulation, and is there evidence of improvement in the years following its introduction?* This question was addressed by interrogating CES data. The most consistent data is for simSchool, 2022-2026, and it reflects the evolution of student perspectives with overwhelmingly negative early feedback transitioning to more positive comments in 2026. In 2022, simSchool was piloted in three courses, and 37 student CES comments mentioned the new technology. These comments were overwhelmingly negative reflecting the rapid introduction of new technology with minimal staff expertise and no integration with course assessment. Two comments were about "best aspects," one stating: "Sim school was great. I did not expect it to be as good as it was. I found I learnt more by actively engaging in the process of sim teaching;" however, the vast majority of student feedback (97%) was overtly critical, complaining simSchool was "a waste of time," "boring," and "pointless." In 2023, simSchool was continued in two courses and trialed in two others. Student feedback was again largely negative; of 23 comments about simSchool, 21 (91%) cite it as an aspect to improve, echoing previous student sentiment.

There was a slight positive shift in 2024, when simSchool was continued in the same four courses. For each course there were two to three "best aspects" comments about simSchool, 11 responses (16% of 67 simulation comments in 2024). However, two of these were in fact critical: "simSchool was a waste of time – a computerised teacher game in which we had to 'teach' computer students and that was how we were being assessed...from A COMPUTER GAME" [anon, EDUC6740, 2024]. The gamification aspect attracted repeated criticism: *"*[simSchool] is one of the most useless components of my degree so far. I honestly got nothing out of it as all you have to do is play the algorithm right to get a good score" [EDUC3026, 2024]. This left 13% of 2024 CES simSchool comments actually highlighting positives, including that it was "fun," "simSchool activities were engaging," and "I actually like simSchool, I don't know what everybody was complaining about" [All anon, EDUC3026, 2024]. Comments for another course praised simSchool as "a nice addition to the content [that] helped understand school behaviours and management skills" and reported "I really like doing Sim School to get a more realistic feel of the classroom" [both anon, EDUC2181, 2024]. Most student comments, however, were consistently negative throughout 2024-5 (87% and 85%). In this context, two comments stand out for their more insightful perspective:

> *I know it's tempting to complain about simSchool. I found it frustrating too. But then right at the end, I was so frustrated that the student frowned every time I gave her an adjustment when it literally is what she is meant to have. So I gave it to the whole class and not just her and she stopped frowning. I realised that it was a valuable teaching moment*. [anon, EDUC3026, 2024]

> *The simSchool concept was initially challenging to grasp, but I eventually understood its purpose and found it highly engaging. The case study on Sady was exceptionally detailed, demonstrating a thorough understanding of her comprehensive care plan. The lecturer's teaching was explicit, well-structured, and effectively supported learning in EDUC6740*.
> [anon, EDUC6740, 2025]

These comments recognise the time required to become conversant with the platform's functionality. It is possible that with more time, and more or different support, more students may experience such "ah ha" moments. In the most recent data, from January to June, 2026, a shift is evident in students' CES comments about simulation. One third of comments (7/20) for three courses were positive or neutral. For the other course, that introduced simulation in 2022, there appears to have been a breakthrough with student perceptions of simulation: half (13/26) of CES simulation comments in 2026 were in response to the "best aspects" question describing it as "fun," and even saying "the simSchool practice is amazing." A further three comments for this course were advice for future students, e.g., "get ahead on simSchool." For the first time, then, a course using simSchool had only one third (8/25, 32%) of simulation-related CES comments in the "improve" category. This reflects the course coordinator's ongoing refinement of simSchool's integration, with greater emphasis on students' data literacy, and the increasing expertise of tutors delivering the platform.

In contrast to simSchool, comments for simTeach (n = 95), were predominantly positive from the outset, with only about one third about aspects to improve, a ratio that remained fairly stable across the three years of data (2023-2026). Positive comments were strong, describing it as "a great experience" and "the best aspect of this course by far." Some suggestions for improvement were directly about the platform but highlighted the need for thorough preparation and clear expectations or requested increased access. One theme much clearer in the simTeach comments than those for simSchool is the strength of students' affective feelings in advance of and during their simulation experiences. For example: "I was really dreading it but it was such a valuable resource" [EDUC2196, 2024], "I hated simteach. It was so daunting and felt wrong" [EDUC2186, 2024], "Get rid of simTeach!! It's a creepy experience" [EDUC6772, 2024], and "SimTeach is an absolute nightmare for students struggling with anxiety disorders" [EDUC6772, 2024]. The strength of these views is testimony to the impact of the platform: while many students find its authenticity beneficial, some find it so emotionally challenging that they are unable to engage effectively. Some students, however, can reconcile these perspectives, noting that practising something "scary" can be valuable: "SimTeach, whilst scary, was quite beneficial in developing quick-thinking and emotional regulation skills" [EDUC3196, 2024]. The more intense simTeach parent-teacher interaction attracted greater criticism than the micro-teach scenario, for example complaining: "why would you set up students to fail?" [EDUC3196, 2023], and "simTeach, where students [were] given a stimulus that was could be seen as triggering…many students would never be put in that situation" [EDUC3196, 2025]. This last comment illustrates the bounded nature of some novice practitioners' understanding of what preservice teachers should be prepared for, which is discussed below.

For simCave, student perceptions were drawn from its evaluation surveys, which receive consistently high ratings. All 33 survey responses for the Dupin indicated agreement or strong agreement with every statement, giving an overall average rating of 5.8 from a maximum of six. Even the comparatively less popular PE lesson experience averaged 4.8, indicating clear agreement that the experience was both enjoyable and useful. Thirty respondents chose to comment on their views, 10 about the PE lesson and 20 about Dupin. The PE experience attracted generally superficial comments that it was "good," "cool" and "interesting," with some more detailed comments stating, "this has given me some experience in what real classrooms are like and has prepared me for the challenges of entering classrooms as a teacher" and that it was useful to have "a tutor to point things out I may not have noticed" [both Anon, PE simCave comments 2024]. The comments about Dupin were effusive, describing it as "incredible," "completely immersive," "meditative" and "unique." Students reported that it "opened my eyes to the ways that a learning experience can be intensified through sensory tools," "deepened my professional learning and [gave] great insights to link to my lessons for students with diverse learning needs," and "I really enjoyed this experience. I didn't want to leave I wanted to stay longer" [both Anon, Dupin simCave, 2023]. It is worth noting that the Dupin sensory story incorporates real stimuli for participants to touch, smell and feel; and that it is delivered by two human facilitators, including a highly experienced inclusive educator. This makes the experience

much more tangible than online platforms, and arguably less "simulated," as well as being dependent on the expertise of individual educators to deliver each session in-person.

RQ2 What reasons do ITE students cite for their perceptions of simulation? For collective analysis of student perspectives across platforms, all 380 CES and survey comments (simSchool, 254; simTeach, 95; simCave, 31) were entered into CoPilot by the first author with instructions to thematically analyse them according to the reasons cited for positive or negative experiences of simulation. CoPilot was chosen due to the researchers' institutional enterprise accounts offering greater data security than other available platforms. The prompt was created by the first author and developed using specialised prompt engineering software. The full prompt and output are available as supplementary materials, as are the resulting themes' full definitions with illustrative quotes. The initial CoPilot output was interpreted, challenged, and restructured by all authors, who manually verified comments' alignment with the proposed themes, corrected coding where required, and adjusted theme definitions to improve clarity and validity. Individual author interpretations were collectively examined and discussed to achieve full agreement in thematic definitions (Wen et al., 2025). CoPilot was then used to re-count comments according to these author-refined definitions, with the resulting output again manually reviewed by the authors (AlGhamdi, 2026). The final themes are shown in Table 2, in which positive and negative themes are grouped in three categories: i) the qualities of the platforms themselves, as experienced by learners, ii) the integration and implementation of platforms by educators within courses, and iii) experienced outcomes of simulation. It is evident through this structuring of the themes that perceived successful outcomes are associated with engaging and authentic experiences, delivered by human facilitators. Conversely, inauthentic experiences, technical friction, unfair assessment and lack of preparedness are seen to cause increased anxiety, stress, and demoralisation.

Table 2.
Structure of themes identified in students' perspectives of simulation (number of comments in parentheses)

	Platform (256)	**Implementation (173)**	**Outcomes (166)**
Positive themes	Engaging and novel (100)	Human facilitation (30)	Practical preparation (87)
		Earlier, longer, or more (19)	Insight into diversity (38)
Negative themes	Inauthenticity or sense of "playing the game" (104)	Unfair assessment (82)	Anxiety, stress, demoralisation (41)
	Technical friction (52)	Insufficient preparation (42)	

RQ3 To what extent do staff perspectives align with or differ from student perspectives? The staff survey was shared with 109 ongoing and fixed-term academic staff in the School of Education, and received 13 complete responses (12%). This sample size is significantly smaller in scale than the student data; however, responses were rich and varied. Respondents rated agreement with seven statements about the utility of simulation in teaching, then answered five open text questions about simulation's potential to bridge the gap between theory and practice, what aspects of professional practice are suited to this and which may be especially challenging, their overall opinion on simulation in ITE, and whether they had recommendations. Six participants also used the final "other comments" box, generating a total of 71 comments for analysis. It was immediately evident that staff report a wide range of opinions. For example, while mean scores for the acceptance scale averaged 4.3, the scores of individual staff participants ranged from 1.9 to six.

The reasons staff gave for positive perceptions consistently centred the ability of simulation to connect educational theory with classroom practice more effectively than traditional coursework. A major perceived strength was the safe rehearsal of pedagogical strategies; for example, "It can provide opportunities to practice skills in a low-stakes, supportive environment before needing to enact skills in the real world." This directly aligns with students' descriptions of preparation for classroom practice. Staff also acknowledged the importance of authenticity, remarking on simCave's ability to showcase "real world teaching situations;" for example, "I believe this is the best way to experience real classrooms without travelling or interrupting

classes," and "I think it brings more authenticity to an ITE program." In terms of the main strengths of simulation, staff cited communication skills, questioning skills, developing confidence, building rapport, behaviour management, and navigating difficult conversations with parents and colleagues. The strengths of

individual platforms were recognised, including simTeach's capacity to develop "embodied practices" in a realistic environment, and simSchool was noted for "developing skills in planning, decision-making and reflection." Beyond rehearsal of skills, staff highlighted all three platforms' ability to promote reflection, discussion and analysis. For simTeach and simCave, staff praised the innovative and motivational aspects of the platforms, "Loved this! I want to take every class through it [simCave]," and "I think it [simTeach] is a fantastic mechanism to explore and, in many cases, has proved to be extremely beneficial and a worthy investment." Again, many of these points echo those reported by students.

Also in line with student perspectives were staff's more negative perceptions of simSchool, described as "clunky" and "fake." One staff member explained, "I do find myself agreeing with a lot of the student dialogue around this form of simulation being limited." Even for platforms seen as more authentic, staff felt simulation cannot replicate the complexity and unpredictability of real classrooms: "there's nothing like being thrown in the deep end in a classroom to learn the nuances of classroom dynamics," and "nothing beats being in the classroom." Of course, simulation is not intended as a substitute for real school placements, only as practical preparation for them. Like students, staff commented on the integration of platforms within courses, particularly alignment with learning outcomes and assessment, and on the usability of platforms, e.g., "initial challenges getting started due to my lack of familiarity with the technology," and suggested "further technical support to ensure those teaching simulation do not also have to take on the technical side of delivery." They also highlighted the dependence of some of these platforms on expert support, especially simTeach and simCave: "the simTeach operator was critical in creating a quality and useful experience for the ITE student."

Clearly the achievement of both staff and student engagement depends on the way simulated experiences are integrated into teaching and assessment. This is in turn dependent on careful pedagogical design by senior instructors, with tutorial staff frequently acting as intermediaries between the course designer and the student users. In this sense, staff attitudes are foundational to the practical implementation of intended learning activities, and so must be considered in planned design and post-hoc evaluation.

Limitations

As with any study, the data presented here is bounded by methodological constraints, the most consequential of which is that use of each platform has evolved considerably over the study period. This means that the model of delivery and assessment in 2026 is not equivalent to earlier years and observed improvements in perception must be understood in that context. Additionally, data are drawn from different sources with different items and response rates. All survey participation was voluntary, so comments may over-represent students and staff with strongly held views, and representativeness cannot be established with confidence. Further, while this study spans multiple courses and cohorts, it was conducted within one Australian School of Education so findings may not generalise to other institutional contexts, disciplines, or platforms. Finally, these data capture perceptions of simulation, not objective measures of teaching practice. Claims cannot be made about whether more positive perceptions translate into improved classroom performance, which would require longitudinal, individual-level tracking beyond the scope of this study.

Discussion

This discussion is structured around the three domains of perception: the platform, its implementation, and the consequent outcomes for students, interpreted with the application of cognitive load theory. It draws on findings from student and staff data and synthesises these into a novel framework for understanding novice perceptions of simulation in ITE. The foundational element is the selection of a platform, which must be deliberately chosen to align with intended learning outcomes, accounting for planned implementation. When platform selection and implementation design align with learner expertise as well as intended learning outcomes, there is a far higher chance of students accepting and engaging with simulation experiences. This is in part because novice perceptions of platforms are heavily influenced by their "face validity," that is, the

extent to which the user judges the simulation to be a credible approximation of reality. A more precise term is "verisimilitude," which is not about objective realism but rather whether the platform enables sufficient suspension of disbelief for the user to engage with it as though it were real. This helps explain the pattern of feedback across all three platforms, with the most positive comments describing the simCave Dupin

experience as a completely immersive and "incredible," while at the opposite end of the spectrum simSchool received harsh criticism with some students claiming no actual learning took place. Both are judgements derived from verisimilitude, but pointing in different directions, and the contrast is instructive. The immersive simCave Dupin experience allows users to enjoy high visual, auditory and sensory fidelity delivered directly by a human facilitator guiding the whole pedagogical experience. By comparison, simSchool is mediated through an online interface that many students described as "glitchy," unintuitive, and time-consuming to master. This friction appears to undermine verisimilitude at least as much as any perceived deficiency in the underlying scenario design. Between these, simTeach contains elements of both, with users speaking and acting naturally to interact with digital avatars voiced by a human actor.

A sense of reality, then, is not simply a property of a platform's audiovisual sophistication, but also whether the mechanics of interaction recede from or intrude upon the user's attention, a finding which supports the work of Chernikova et al. (2020). Where interaction intrudes, as in reports of lag, or unintuitive interfaces, the extraneous cognitive load imposed competes directly for the cognitive resources that would otherwise be applied to the intrinsic load of the content or the germane load of the learning itself. If a platform fails to meet novice expectations of verisimilitude, students will consider it inauthentic and will discount its value accordingly, thus reducing their motivation to constructively engage. This novice need for verisimilitude runs counter to established principles of progression from low to high fidelity simulation, with lower fidelity environments assumed to reduce extraneous cognitive load (Reedy, 2015). While lower fidelity contexts do reduce complexity, they impose a different cognitive burden in asking the user to override pre-existing expectations and ignore the evident "unreality" of the experience. This suggests that novice practitioners are likely to respond more positively when offered simulations with high verisimilitude.

This intersects with a second dimension that is equally important to students' experiences, which is the degree of agentic control asked of them; that is, the extent to which they must take responsibility for the experience or the degree to which an expert facilitator assumes that role. At one end of this spectrum, simSchool asks students to control complex interactions very independently, with automated feedback and minimal human support. Thus, it imposes a high cognitive load, particularly for novice learners. In contrast, simCave allows students no agentic control, instead delivering a fully facilitated experience in which students are expertly guided through experiential observation, thus considerably reducing cognitive load (Mulholland et al., 2022). With no "performance" element, simCave offers zero opportunity for failure, thus no perceived threat to self-efficacy or self-esteem and so remains emotionally safe even when presenting challenging content. simTeach again falls somewhere between the other platforms, requiring high agentic control but with a human actor leading the interaction and a human facilitator in the room for guidance and feedback.

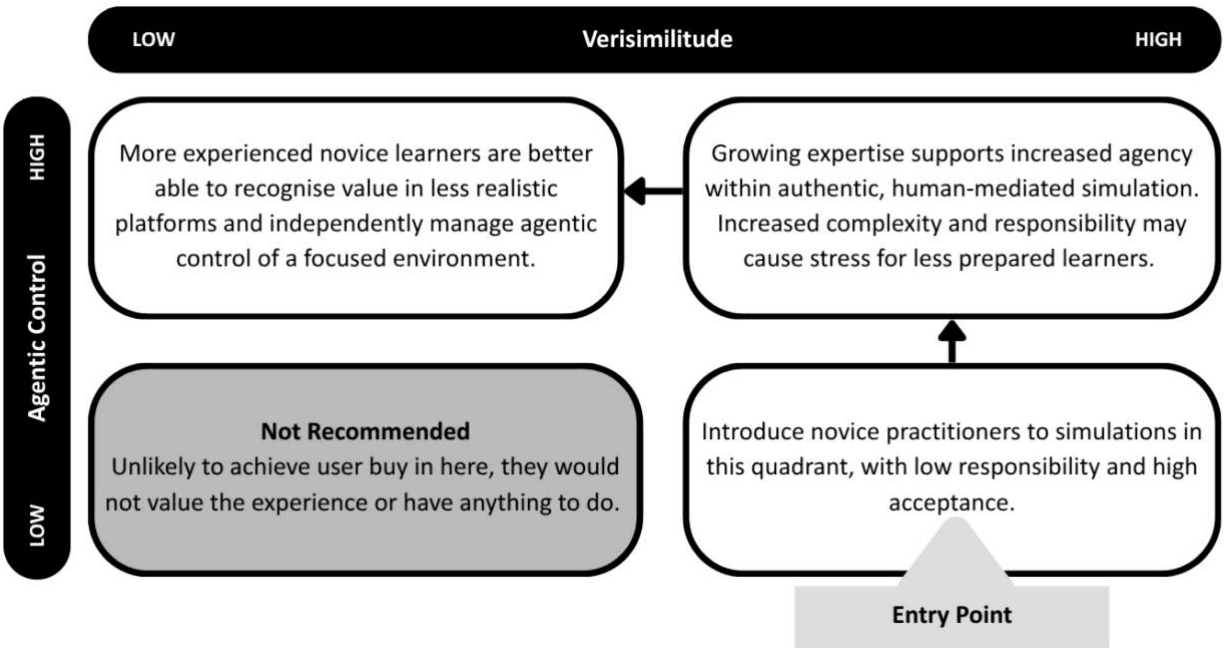
While practising agentic control is essential to build professional competency, the potential negative consequences of requiring higher agentic control, even in a supportive environment, is evident in students' voices. Where students must perform, and therefore may "fail," their affective register intensifies sharply, moving from measured critique to language of dread and even distress: "I hated simTeach. It was so daunting." [EDUC2186, 2024]; "simTeach is an absolute nightmare for students struggling with anxiety disorders" [EDUC6772, 2024]. Yet some of these same students go on to reconcile the discomfort with its purpose, observing that simTeach, "whilst scary, was quite beneficial in developing quick-thinking and emotional regulation skills" [EDUC3196, 2024]. This is the central tension in agentic simulation: the features that make it valuable for rehearsal of professional skills such as decision-making, classroom management, and responding under pressure, are precisely the same features that generate cognitive and affective burden. For unprepared or anxious novices this can tip from productive discomfort into outright rejection.

Cognitive load is informative here because the load imposed by managing greater agency will reduce as preservice teachers transition from novice to "less novice" (Chernikova et al., 2020). Management of this process matters because high cognitive load both impedes learning and increases stress, as is clear in students' comments. To some extent, discomfort is an inherent part of transition; whether students "like"

the experience does not equate to whether it is valuable for them. However, discomfort can only be tolerated so far before learners disengage from the experience altogether. From the students' perspective, the problem lies with the platform or its implementation, but the underlying issue is misalignment of those factors in relation to the student's current level of expertise. This creates an inherent tension, because for a simulation to enable preservice teachers to practice skills such as decision-making and classroom management, which are inherently agentic, it is necessary that the simulation is interactive so that the user actually enacts some version of those skills. This requires placing some degree of agency in the hands of the user. It is possible for preservice teachers to build awareness within non-agentic, non-interactive simulations; however, these cannot bridge the theory-practice divide in the same way as simulations with agentic interaction. The "cost" of that for novice learners is increased effort and stress, because being "in the driving seat" increases cognitive load and affective burden. This may then be mitigated with supportive instruction and reflection. Therefore, supportive implementation of platforms that have been selected with consideration of student expertise offers students the best opportunity to benefit from the numerous advantages of simulation.

The dimensions of verisimilitude and agency, illustrated in Figure 1, offer a useful way of anticipating novice practitioners' likely response to a given simulation platform, because the degree to which verisimilitude and agency affect user experience is mediated by the user's level of expertise. High-verisimilitude/low-agency platforms such as simCave offer the most favourable entry-point for novices because their acceptance is high, and responsibility is minimal because the experience is fully facilitated by staff. High-verisimilitude/ high-agency platforms such as simTeach offer the most authentic form of simulation and are well-suited to learners with sufficient expertise to manage that level of responsibility, but the same combination produces high stress responses in less prepared users, so must be supportively scaffolded. Low-verisimilitude/high-agency platforms, such as simSchool, are the most fragile combination, since students are asked to shoulder responsibility in an interaction that does not feel authentic; and low-verisimilitude/low-agency configurations are unlikely to achieve any buy-in at all, since students have neither an authentic experience nor a meaningful role.

Figure 1
Platform characteristics that inform effective selection and placement of simulation



Conclusions and recommendations

This paper offers a broad, multi-platform account of student and staff perceptions of simulation, drawing on data spanning five years of use. The evidence suggests that students' valuing of simulation (RQ1), while mixed and at times strongly negative, does show signs of improvement over time, particularly for simSchool. The reasons students cite for their perceptions (RQ2) centre around three domains: the platform's verisimilitude and demands on agency, the quality of its implementation and human support, and the resulting cognitive and affective outcomes for the learner. Staff perspectives largely (RQ3) mirror those of students and highlight the essential role of staff in mediating student experiences of simulation.

The platform characteristics matrix (Figure 1) offers an insightful understanding of whether a particular platform's verisimilitude and agency align with the expertise of a given cohort at a given point in their program. Such a tool, that can be applied to evaluate the suitability of any emerging technology, is necessary given the accelerating pace of development in the simulation space. No platform is inherently superior; each can be more or less successful depending on when novice practitioners are asked to engage with it, and how carefully it is implemented. This leads to several key recommendations. Firstly, human facilitation should be maintained wherever possible, since staff attitudes and expertise mediate students' perceptions of value and are foundational to their experiences. We recommend continuous evaluation of how simulation is received by students, with responsiveness to changes over time. Positive shifts in perception may indicate that implementation is maturing, but persistent negative feedback may reflect inappropriate positioning of platforms. Such feedback should inform ongoing review of where, when and how simulation is integrated in programs, taking account of the novice perspective of preservice teachers who are, by definition, less equipped to judge what simulation is preparing them for. It therefore falls to the educators designing and delivering simulation experiences to carefully bridge that gap on their behalf.

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