

Perceived Practicality, Perceived Acceptability, and Perceived Educational Effect of AI-Powered Simulation Tools Among Stakeholders of a Nursing School in Kalibo, Aklan

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ABSTRACT

The integration of artificial intelligence (AI)-powered simulation tools has emerged as a promising strategy for strengthening nursing education, particularly in provincial and resource-limited settings where traditional high-fidelity simulation may be constrained by cost, equipment, and faculty requirements. This descriptive-correlational study examined the perceived practicality, acceptability, and educational effect of AI-powered simulation tools among stakeholders of a nursing school in Kalibo, Aklan. A total of 313 respondents composed of Bachelor of Science in Nursing students, clinical instructors, and faculty members participated through purposive sampling. Data were gathered using a validated and reliable researcher-made questionnaire administered through Google Forms. Descriptive statistics,

weighted means, standard deviations, and Pearson correlation analysis were used to analyze the data. Findings showed that stakeholders agreed that the AI-powered simulation tool was practical ($M = 4.11$), acceptable ($M = 4.20$), and educationally effective ($M = 4.31$). The highest ratings emphasized clear instructions, continued use in the nursing program, engagement, patient safety awareness, and the ability to connect theoretical knowledge with clinical scenarios. Age and sex were not significantly associated with stakeholder perceptions, while stakeholder role, clinical exposure setting, familiarity with simulation-based learning, and frequency of simulation use showed significant relationships. The study concludes that AI-powered simulation tools are viable instructional innovations for nursing education in provincial contexts. Institutional integration, improved internet infrastructure, and structured faculty facilitation are recommended to maximize equitable and effective implementation.

Keywords: *AI-powered simulation, nursing education, practicality, acceptability, educational effect, simulation-based learning*

INTRODUCTION

The development of effective clinical decision-making skills remains a continuing challenge in nursing education, especially in provincial and resource-limited settings. Traditional simulation strategies such as role-playing, paper-based case studies, standardized patients, and high-fidelity mannequins are recognized for supporting critical thinking, communication, self-efficacy, and clinical competence; however, these approaches may be difficult to sustain because of equipment costs, maintenance demands, space requirements, and the need for trained simulation faculty (Jeon et al., 2020; Sahin Karaduman & Basak, 2024). These limitations are

particularly relevant for nursing schools outside major urban centers, where access to advanced training infrastructure may be uneven.

Artificial intelligence (AI)-powered simulation tools respond to these constraints by providing interactive, adaptive, and repeatable learning experiences. AI-driven simulation and virtual environments can present realistic patient scenarios, provide feedback, support branching clinical decisions, and allow learners to practice without exposing actual patients to risk (Jung, 2023; Liaw et al., 2023; Martinez-Ortigosa et al., 2023). In nursing education, these features are valuable because they allow students to connect theoretical concepts with realistic clinical situations while developing confidence, judgment, and patient safety awareness.

Despite the increasing global interest in AI-enhanced simulation, evidence from provincial Philippine nursing schools remains limited. Regional institutions in places such as Kalibo, Aklan may face barriers such as variable connectivity, limited technical support, budget constraints, and differences in stakeholder readiness. Without localized evidence on practicality, acceptability, and perceived educational value, administrators and educators may lack sufficient basis for making technology adoption decisions. This study therefore examined the perceptions of nursing students, faculty, and clinical instructors regarding AI-powered simulation tools in a nursing school in Kalibo, Aklan.

Literature Review

Simulation-Based Learning and AI-Powered Simulation in Nursing Education

Simulation-based learning has long been used to bridge the gap between classroom instruction and clinical practice. High-fidelity mannequins, standardized patients, and role-playing allow nursing students to rehearse clinical reasoning, psychomotor skills, and communication in controlled environments. However, traditional simulation requires substantial resources, specialized facilities, and trained personnel, creating implementation challenges for smaller or provincial institutions. Recent literature suggests that virtual and AI-supported simulation can address some of these limitations by offering scalable, accessible, and adaptive learning environments (Chernikova et al., 2020; Foronda et al., 2020; Hamilton, 2024).

AI-powered simulation tools extend simulation-based learning by generating dynamic scenarios, providing immediate feedback, and adapting to learner responses. These functions can reduce dependence on physical laboratory schedules and allow learners to repeat clinical cases until mastery is achieved. Studies in nursing and health professions education indicate that technology-enhanced simulation supports learner engagement, clinical reasoning, patient safety awareness, and self-directed learning when properly aligned with curriculum objectives (Elendu et al., 2024; Liaw et al., 2023).

Technology Acceptance, Practicality, and Acceptability

The Technology Acceptance Model explains that users are more likely to adopt a technology when they perceive it as useful and easy to use (Davis, 1989). Related technology adoption frameworks also emphasize facilitating conditions, institutional support, system reliability, and user familiarity as important predictors of sustained use (Venkatesh et al., 2022). Within nursing education, practicality may be reflected in ease of operation, clear instructions, compatibility with existing schedules, smooth navigation, and minimal technical burden. Acceptability may be reflected in satisfaction, willingness to recommend, alignment with nursing values, motivation, and readiness to adopt the tool as part of regular instruction.

In resource-limited contexts, practicality and acceptability are shaped not only by interface design but also by infrastructure. Even when learners and faculty value AI-powered simulation, internet stability and access to devices can influence the fairness and sustainability of implementation. Thus, stakeholder evaluation is necessary before institutionalizing AI simulation tools as a regular component of nursing instruction.

Educational Effect of AI-Powered Simulation

The educational effect of AI simulation refers to stakeholders' perception that the tool improves understanding, clinical decision-making, critical thinking, patient safety awareness, reflective practice, and readiness for real clinical settings. AI-powered simulation is especially relevant for nursing because it can help students practice judgment in low-risk environments before encountering actual patients. However, the literature

also suggests that simulation tools should not replace instructor guidance. Instead, they should complement traditional teaching by providing repeated case exposure while faculty guide debriefing, ethical reflection, and clinical reasoning.

Conceptual Framework

The study followed an Input-Process-Output logic. The inputs were stakeholder characteristics and perception domains; the process consisted of survey administration and statistical analysis; and the output consisted of stakeholder perception results, correlation findings, and recommendations for integrating AI-powered simulation tools in nursing education.

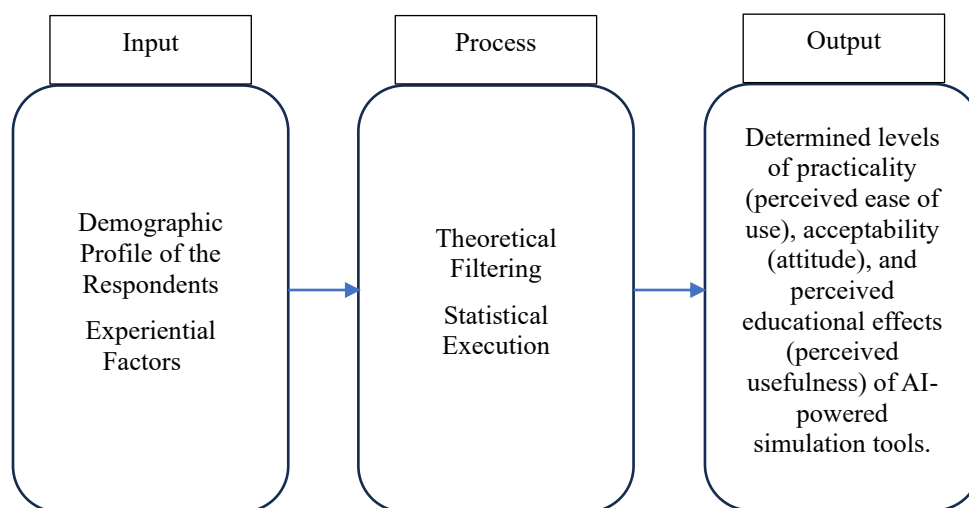


Figure 1. *Conceptual framework of the study.*

METHODS

Research Design

This study employed a descriptive-correlational quantitative research design. The design was appropriate because the study described existing stakeholder perceptions of AI-powered simulation tools and examined relationships between demographic or experience-related variables and the perception domains without manipulating the learning environment (McCombes, 2020; Polit & Beck, 2021).

Research Locale

The study was conducted in a nursing school located in Kalibo, Aklan. The locale was appropriate because it represents a provincial nursing education context where access to advanced simulation technologies is still developing and where institutional decisions about AI-powered tools require evidence grounded in local stakeholder experience.

Participants and Sampling Technique

The respondents were Bachelor of Science in Nursing students, clinical instructors, and faculty members who were considered key users and evaluators of AI-powered simulation tools. From an estimated stakeholder population of 450, the required sample size was computed at 313 using a 5% margin of error and 95% confidence level. Purposive sampling was used to include respondents with exposure to or familiarity with simulation-based learning so that perceptions would be based on informed experience rather than arbitrary judgment.

Research Instrument

A researcher-designed survey questionnaire was used to gather data. It included demographic information and three perception domains: perceived practicality, perceived acceptability, and perceived educational effect of the AI-powered simulation tool. Items were measured using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The instrument was reviewed by two nursing education content experts and a statistician. Pilot testing among 17 non-participant stakeholders produced a Cronbach's alpha of 0.931, while final reliability analysis with the actual sample produced an overall Cronbach's alpha of 0.886, indicating good reliability.

Data Gathering Procedure

Ethics clearance was secured before data collection. Institutional permission was obtained from the nursing school, after which potential respondents received an orientation about the study purpose, procedures, voluntary participation, confidentiality, and right to withdraw. The validated questionnaire was administered through Google Forms. After the survey window closed, responses were checked for completeness, consolidated, encoded, and prepared for statistical analysis.

Data Analysis

Frequency and percentage were used to describe respondent profiles. Weighted mean and standard deviation were used to summarize perceived practicality, acceptability, and educational effect. Pearson's product-moment correlation was used to examine relationships between respondent variables and perception domains. Statistical significance was tested at the 0.05 level.

Ethical Consideration

The study followed principles of social value, informed consent, respect for vulnerability, privacy, confidentiality, justice, and transparency. Participation was voluntary, responses were collected anonymously, and data were used only for academic and institutional improvement purposes.

RESULTS AND DISCUSSION

Profile of the Respondents

Table 1. *Demographic profile of the respondents (n = 313).*

| Variable | Category | Count | % of Total |
|------------------|---------------------|-------|------------|
| Age | 20-29 years old | 200 | 63.8% |
| Age | Prefer not to say | 120 | 38.2% |
| Sex | Female | 239 | 76.3% |
| Sex | Male | 73 | 23.3% |
| Sex | Other / Option 3 | 3 | 1.0% |
| Stakeholder Role | BSN Student | 288 | 92.0% |
| Stakeholder Role | Clinical Instructor | 22 | 7.0% |
| Stakeholder Role | Faculty Member | 3 | 1.0% |

The respondent profile was predominantly composed of young adult BSN students and female participants. This pattern reflects common demographic trends in nursing education, where female learners remain highly represented and students constitute the primary users of simulation-based learning tools. The inclusion of clinical instructors and faculty members also provided educator perspectives, although the overall data remained

student-centered. The profile suggests that the perceptions largely reflect the experiences of direct learners who are expected to use AI-powered simulation in academic and clinical preparation.

Perceived Practicality of AI-Powered Simulation Tools

Table 2. Level of perceived practicality of the AI-powered simulation tool.

| Indicator | Mean | SD | Description |
|--|------|------|-------------|
| Easy to operate without assistance | 4.21 | 0.76 | Agree |
| Works consistently without frequent glitches | 3.98 | 0.84 | Agree |
| Accessible using available school equipment | 4.05 | 0.80 | Agree |
| Instructions are clear and easy to follow | 4.32 | 0.70 | Agree |
| Can be integrated into schedule or lesson plan | 4.10 | 0.78 | Agree |
| Navigation is smooth and intuitive | 4.18 | 0.74 | Agree |
| Runs efficiently even on low-bandwidth access | 3.85 | 0.88 | Agree |
| Requires minimal technical support | 4.00 | 0.82 | Agree |
| Layout and visual interface are user-friendly | 4.25 | 0.69 | Agree |
| Supports flexible use in school or at home | 4.12 | 0.77 | Agree |
| Overall Practicality | 4.11 | 0.76 | Agree |

Stakeholders agreed that the AI-powered simulation tool was practical, with an overall mean of 4.11. The highest-rated item concerned the clarity of instructions ($M = 4.32$), followed by user-friendly layout and visual interface ($M = 4.25$) and ease of operation without assistance ($M = 4.21$). These findings indicate that the tool can be operated independently and can support flexible learning. The lowest mean was obtained for efficient operation under low-bandwidth conditions ($M = 3.85$), suggesting that connectivity remains a key implementation concern in provincial settings. From the perspective of technology acceptance, perceived ease of use and facilitating conditions are central to sustained adoption (Davis, 1989; Venkatesh et al., 2022).

Perceived Acceptability of AI-Powered Simulation Tools

Table 3. Level of perceived acceptability of the AI-powered simulation tool.

| Indicator | Mean | SD | Description |
|---|------|------|-------------|
| Satisfied with overall experience | 4.26 | 0.71 | Agree |
| Comfortable using the tool regularly | 4.18 | 0.74 | Agree |
| Meets expectations for digital learning tools | 4.12 | 0.77 | Agree |
| Aligns with values and goals of nursing education | 4.31 | 0.68 | Agree |
| Would recommend the tool to others | 4.24 | 0.72 | Agree |
| Would like continued use in the program | 4.33 | 0.67 | Agree |
| Fits school instructional style | 4.15 | 0.75 | Agree |
| Motivates active participation | 4.09 | 0.79 | Agree |
| Promotes fairness and inclusiveness | 4.05 | 0.81 | Agree |
| Willing to adopt tool regularly | 4.28 | 0.70 | Agree |

| | | | |
|-----------------------|------|------|-------|
| Overall Acceptability | 4.20 | 0.73 | Agree |
|-----------------------|------|------|-------|

The overall acceptability rating was high ($M = 4.20$). Stakeholders most strongly agreed that they would like to see continued use of the tool in the program ($M = 4.33$) and that the tool aligns with nursing education values and goals ($M = 4.31$). These findings show strong stakeholder buy-in and indicate readiness for curricular integration. The relatively lower but still positive rating for fairness and inclusiveness ($M = 4.05$) implies that access to devices, connectivity, and familiarity should be considered when designing implementation policies.

Perceived Educational Effect of AI-Powered Simulation Tools

Table 4. *Level of perceived educational effect of the AI-powered simulation tool.*

| Indicator | Mean | SD | Description |
|--|------|------|-------------|
| Improved understanding of nursing concepts | 4.34 | 0.66 | Agree |
| Increased confidence in clinical decision-making | 4.28 | 0.70 | Agree |
| Linked theory with real-world clinical scenarios | 4.36 | 0.64 | Agree |
| Promoted critical thinking and analysis | 4.31 | 0.68 | Agree |
| Made learning more engaging | 4.40 | 0.63 | Agree |
| Allowed reflection on clinical performance | 4.22 | 0.72 | Agree |
| Prepared users for real clinical settings | 4.27 | 0.69 | Agree |
| Increased awareness of patient safety | 4.38 | 0.65 | Agree |
| Supported useful clinical skill development | 4.35 | 0.67 | Agree |
| Enhanced ability to work under pressure | 4.19 | 0.73 | Agree |
| Overall Perceived Educational Effect | 4.31 | 0.68 | Agree |

The educational effect of the AI-powered simulation tool received the highest overall rating among the three domains ($M = 4.31$). Stakeholders agreed most strongly that AI simulation made learning more engaging ($M = 4.40$), increased patient safety awareness ($M = 4.38$), and helped connect theory with real-world clinical scenarios ($M = 4.36$). These findings support the value of AI simulation as a bridge between classroom learning and clinical application. The lowest educational effect item, while still positive, concerned working under pressure ($M = 4.19$), suggesting that more complex high-stakes scenarios and instructor-facilitated debriefing may be needed to strengthen crisis management and emotional readiness.

Relationship Between Profile Variables and Stakeholder Perceptions

Table 5. *Summary relationship between profile variables and the three perception domains.*

| Variable | Practicality (r) | Acceptability (r) | Educational Effect (r) | p-value | Interpretation |
|------------------|------------------|-------------------|------------------------|---------|-----------------|
| Age | 0.09 | 0.11 | 0.08 | 0.118 | Not Significant |
| Sex | 0.05 | 0.07 | 0.04 | 0.326 | Not Significant |
| Stakeholder Role | 0.14 | 0.16 | 0.19 | 0.021 | Significant |

Age and sex did not significantly influence perceptions of practicality, acceptability, and educational effect, indicating that the AI-powered simulation tool was generally perceived positively across basic demographic

groups. Stakeholder role, however, showed a significant relationship ($p = 0.021$), suggesting that students, instructors, and faculty may evaluate the tool differently according to their responsibilities and level of involvement in simulation-based learning.

Table 6. *Relationship between selected variables and perceived practicality.*

| Variable | r-value | p-value | Interpretation | Decision |
|--|---------|---------|----------------|-----------------|
| Age | 0.10 | 0.094 | Very Weak | Not Significant |
| Sex | 0.06 | 0.284 | Very Weak | Not Significant |
| Clinical Exposure Setting | 0.17 | 0.006 | Very Weak | Significant |
| Familiarity with Simulation-Based Learning | 0.34 | <0.001 | Weak | Significant |
| Frequency of Using Simulation Tools | 0.43 | <0.001 | Moderate | Significant |
| Stakeholder Role | 0.15 | 0.018 | Very Weak | Significant |

Table 7. *Relationship between selected variables and perceived acceptability.*

| Variable | r-value | p-value | Interpretation | Decision |
|--|---------|---------|----------------|-----------------|
| Age | 0.12 | 0.058 | Very Weak | Not Significant |
| Sex | 0.08 | 0.191 | Very Weak | Not Significant |
| Clinical Exposure Setting | 0.19 | 0.002 | Very Weak | Significant |
| Familiarity with Simulation-Based Learning | 0.38 | <0.001 | Weak | Significant |
| Frequency of Using Simulation Tools | 0.47 | <0.001 | Moderate | Significant |
| Stakeholder Role | 0.18 | 0.004 | Very Weak | Significant |

Table 8. *Relationship between selected variables and perceived educational effect.*

| Variable | r-value | p-value | Interpretation | Decision |
|--|---------|---------|----------------|-----------------|
| Age | 0.11 | 0.072 | Very Weak | Not Significant |
| Sex | 0.07 | 0.214 | Very Weak | Not Significant |
| Clinical Exposure Setting | 0.21 | 0.001 | Weak | Significant |
| Familiarity with Simulation-Based Learning | 0.41 | <0.001 | Moderate | Significant |
| Frequency of Using Simulation Tools | 0.49 | <0.001 | Moderate | Significant |
| Stakeholder Role | 0.17 | 0.006 | Very Weak | Significant |

Correlation results showed that experience-related variables mattered more than fixed demographic traits. Familiarity with simulation-based learning and frequency of using simulation tools were consistently significant, with frequency of use showing moderate relationships across practicality, acceptability, and educational effect. This implies that repeated exposure helps stakeholders understand the tool's functions, value, and instructional relevance. The findings also suggest that effective implementation should include orientation, repeated use, and guided integration rather than one-time exposure.

CONCLUSION

The study concludes that AI-powered simulation tools are perceived as practical, acceptable, and educationally effective by stakeholders of a nursing school in Kalibo, Aklan. The tool's strongest practical features include clear instructions, user-friendly interface, independent operation, and flexible use. Stakeholder acceptability is also strong, particularly in terms of satisfaction, willingness for continued use, and alignment with nursing education values.

The perceived educational effect is highly positive. Stakeholders believe that AI-powered simulation improves engagement, patient safety awareness, clinical decision-making confidence, and the connection between theoretical knowledge and real clinical scenarios. However, the tool's ability to operate under low-bandwidth conditions and its capacity to fully develop performance under pressure require further strengthening.

Age and sex do not significantly shape perceptions, indicating a generally inclusive learning experience. In contrast, stakeholder role, clinical exposure setting, familiarity with simulation-based learning, and frequency of simulation use influence perceptions. Regular engagement and prior familiarity are therefore important in maximizing the perceived value of AI-powered simulation tools.

Recommendations

Nursing education institutions should institutionalize AI-powered simulation tools as part of the nursing curriculum, especially in courses requiring clinical decision-making, patient safety, and theory-to-practice integration. Investments in stable internet connectivity, device access, and technical support should accompany implementation to address low-bandwidth concerns and promote equity among learners.

Nursing educators and clinical instructors should use AI simulation as a complement to traditional skills laboratory activities. Structured orientation, guided practice, and instructor-led debriefing should be provided so that students can use the tool independently while still receiving support for critical thinking, reflection, and clinical reasoning.

Curriculum developers and policy makers should consider formal guidelines for AI simulation integration in nursing education. These guidelines should include minimum standards for usability, accessibility, ethical use, student support, and alignment with clinical competency requirements.

Future researchers should conduct longitudinal and multi-institutional studies to determine whether positive perceptions of AI-powered simulation translate into measurable improvements in clinical competence, skill retention, licensure readiness, and real-world nursing performance. Comparative studies involving rural and urban schools are also recommended to examine the role of infrastructure and institutional readiness.

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