

Stakeholder perceptions of ethical considerations, inclusivity and societal impact of artificial intelligence in Philippine higher education

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Abstract

This exploratory cross-sectional study compared how students, faculty members, and administrators at a Philippine public university evaluated ethical considerations, inclusivity, and the perceived societal impact of artificial intelligence in higher education. The sample comprised 290 purposively recruited stakeholders: 185 students, 65 faculty members, and 40 administrators. Three prespecified composite indices covered ethical considerations, inclusivity, and perceived societal impact. Reliability estimates, Welch tests, Games–Howell comparisons, Pearson correlations, and role-adjusted ordinary least-squares regressions with HC3 heteroskedasticity-robust standard errors were computed. Stakeholder roles differed in inclusivity and perceived societal-impact ratings but not in ethical-consideration ratings. Students rated inclusivity higher than faculty members, whereas administrators reported more positive perceived-societal-impact ratings than students and faculty members. Ethical-consideration ratings were positively associated with inclusivity. After stakeholder role was controlled, both ethical considerations and inclusivity remained independently associated with perceived societal impact; the model explained 39.3% of the variance. These findings reveal divergence between strategic and classroom perspectives and support participatory institutional governance that integrates ethical safeguards, accessibility, infrastructure readiness, and stakeholder consultation. Because the ethical-considerations index had low internal consistency and the sample came from one institution, the results should be interpreted as exploratory rather than as validated or nationally representative estimates.

Introduction

Artificial intelligence is reshaping higher education through generative tools, learning analytics, automated feedback, academic advising, and institutional decision support. Reviews of the field document applications in prediction, assessment, tutoring, personalization, and institutional services, while also noting that educator perspectives have historically received less attention [1], [2]. Generative AI may widen access to learning, support differentiated instruction, and increase administrative efficiency, but its educational value depends on how well institutions manage limitations such as inaccurate output, overreliance, and uneven user capability [3], [4], [5]. Consequently, institutional adoption cannot be evaluated solely through technical performance. It must also be examined through the experiences and judgments of the people who teach with, learn through, and govern AI-enabled systems. Recent syntheses likewise describe generative AI as simultaneously expanding instructional possibilities and creating new risks for reliability, assessment, and human oversight [6], [7], [8], [9].

Ethical AI frameworks commonly emphasize respect for autonomy, prevention of harm, fairness, explainability, and accountable governance [10], [11], [12]. Within higher education, these principles have practical consequences. Data-intensive tools may collect sensitive learner information; opaque models may influence assessment or support decisions without understandable explanations; and large language models may reproduce biases and other harms embedded in training data and development practices [13], [14], [15], [16]. Value-sensitive design can help translate ethical principles into concrete educational technology decisions [17]. Academic-integrity concerns likewise require assessment

redesign, clear disclosure rules, and education about responsible use rather than reliance on detection alone [18], [19]. Ethical safeguards therefore operate not only as policy commitments but also as conditions that may influence stakeholders' confidence in institutional AI use. International guidance consequently emphasizes human rights, educator responsibility, teacher AI competencies, and institution-wide ethical capacity [20], [21], [22], [23].

Inclusivity is related to, but distinct from, ethical governance. Inclusive educational technology should reduce rather than reproduce barriers, remain usable across diverse abilities and circumstances, and support meaningful participation. Human-centred guidance for generative AI emphasizes data privacy, age-appropriate use, equitable access, and protection of human agency [24]. However, AI availability does not automatically produce inclusion. Benefits may be uneven when learners differ in connectivity, devices, accessibility support, language, or AI literacy [25], [26]. Stakeholders may therefore evaluate inclusion through their direct experience of whether AI tools expand or constrain participation. Global and higher-education analyses indicate that educational technology contributes to equitable learning only when relevance, access, pedagogy, and user capability are addressed together [27], [28].

Perceived societal impact represents a broader evaluation of whether AI contributes to educational equity, responsible innovation, public trust, and the future of teaching and learning. Such evaluations may reflect both immediate experiences of accessibility and wider beliefs about fairness and institutional accountability [29], [30], [31]. Student evidence shows that perceived benefits such as personalized support and efficiency coexist with concerns about accuracy, privacy, fairness, and academic integrity [32]. Students, faculty, and administrators may therefore not evaluate these matters in the same way. Administrators may view AI through institutional strategy and governance, faculty through classroom implementation and professional responsibility, and students through usability, access, and learning experience. Responsible-AI scholarship further emphasizes trustworthy service design, human control, reliability, safety, and human-centred outcomes [33], [34].

Much AI-in-education research examines adoption intentions, performance, or normative principles separately. Fewer empirical studies compare ethical considerations, experienced inclusivity, and perceived societal impact across students, faculty members, and administrators within the same institution. This omission matters because role-based judgments may reveal gaps between institutional strategy and classroom experience that single-group studies cannot detect. The Philippine setting adds more than geographical variation: rapid AI uptake occurs alongside uneven infrastructure, digital literacy, access, and institutional readiness, making the relationship between responsible governance and inclusion especially consequential. Current university policy studies document continuing variation in institutional AI guidance and the need for clearer, context-sensitive governance frameworks [35], [36].

Philippine evidence shows that instructors and administrators recognize AI's value for teaching, research, and administrative work while expressing concerns about reliability, ethics, preparedness, and institutional guidance [37]. Nationally oriented scholarship emphasizes the need for HEIs to weigh benefits against risks and develop coherent policies before embedding AI broadly in curricula [38].

Research on Philippine IT education further identifies limited resources, connectivity, technical expertise, and digital inequity as practical constraints on AI integration [39]. These conditions make inclusivity inseparable from infrastructure and institutional capacity.

The survey operationalized three areas of stakeholder perception through 14 closed-ended items: four items on ethical considerations, five on inclusivity, and five on perceived societal impact. These a priori groupings were used to calculate three composite indices, and their internal consistency is reported transparently. The indices are treated as exploratory measures because the available instrument documentation does not provide sufficient evidence of factor structure, convergent validity, or discriminant validity. Accordingly, the study does not interpret individual items as separate ethical or design constructs.

Accordingly, this exploratory study addressed five questions: how the three stakeholder groups evaluated ethical considerations, inclusivity, and perceived societal impact; whether their ratings differed; how the three indices were associated; whether ethical considerations were associated with inclusivity after role adjustment; and whether ethical considerations and inclusivity were associated with perceived societal impact after role adjustment.

Methods

Research design and setting

The study used a quantitative, cross-sectional survey design. Data were collected at Mindanao State University-Iligan Institute of Technology (MSU-IIT), a public higher education institution in the southern Philippines. The design was appropriate for describing stakeholder perceptions and estimating associations among measured variables. Because all variables were measured at one time, the analyses do not establish causality or temporal direction.

Participants and sampling

Purposive recruitment targeted MSU-IIT students, faculty members, and personnel serving in administrative roles. The questionnaire introduced instructional, administrative, and analytical examples of educational AI and asked respondents about their familiarity with such tools. The analysis included 290 complete responses: 185 students (63.8%), 65 faculty members (22.4%), and 40 administrators (13.8%). Each participant was classified under one stakeholder role for analysis, although possible overlap between teaching and administrative responsibilities was not measured. Age was recorded in six categories and gender in three categories; one gender response was missing. The largest age categories were 21–30 years (41.7%) and 18–20 years (31.7%). Table 1 summarizes the sample. Because invitation counts, refusals, recruitment-channel details, and an institution-wide demographic benchmark were unavailable, response rate, nonresponse bias, and proportional representativeness could not be evaluated. The purposive, single-institution sample limits statistical generalization.

Table 1
Participant profile (N = 290)

Characteristic	Category	n	%
Stakeholder role	Student	185	63.8
	Faculty member	65	22.4
	Administrator	40	13.8
Age	18–20 years	92	31.7
	21–30 years	121	41.7
	31–40 years	38	13.1
	41–50 years	26	9.0
	51–60 years	10	3.4
	Above 60 years	3	1.0
Gender	Male	97	33.4
	Female	183	63.1
	Prefer not to say	9	3.1
	Missing	1	0.3
<i>Note. Percentages may not sum to 100.0 because of rounding.</i>			

Research instrument

The questionnaire comprised demographic questions, an AI-familiarity question, a checklist of instructional, administrative, and analytical AI tools, stakeholder-role categories, three open-ended questions, and 14 closed-ended perception items rated on a five-point scale. The perception items were organized a priori into ethical considerations (four items), inclusivity (five items), and perceived societal impact (five items). Composite scores were calculated as the arithmetic mean of the items within each domain, with higher values indicating more positive evaluations. No item responses were missing. The familiarity checklist, educational-background responses, and open-ended answers were not included in the quantitative analysis. Because the available instrument documentation does not establish content-validity procedures, factor structure, convergent validity, or discriminant validity, the three composites are treated as exploratory indices rather than validated latent scales.

Internal consistency was estimated with Cronbach's alpha. Inclusivity ($\alpha = .829$) and societal impact ($\alpha = .803$) demonstrated good consistency for research use. The four-item ethical-considerations index produced $\alpha = .581$. Hair et al. [40] describe .60-.70 as potentially acceptable only in exploratory research; thus, .581 falls slightly below even that provisional range. The index was retained as a transparent, a

priori descriptive composite rather than presented as a validated scale, because deleting an item solely to raise alpha would constitute an unsupported post hoc alteration. All estimates involving the index are treated as provisional and subject to greater measurement error and possible attenuation.

Table 2
Descriptive statistics and internal consistency of the study indices

Index	Items	Possible range	M	SD	Cronbach's α
Ethical considerations	4	1–5	3.47	0.63	.581
Inclusivity	5	1–5	3.62	0.73	.829
Perceived societal impact	5	1–5	3.73	0.65	.803
<i>Note. Higher scores indicate more positive perceptions. The ethical-considerations index is exploratory; $\alpha = .581$ is below the .60-.70 provisional range discussed by Hair et al. [40].</i>					

Data collection procedure

Participants received an information and consent form describing the study purpose, expected 10–15-minute completion time, voluntary participation, confidentiality protections, possible risks and benefits, withdrawal rights, and researcher contact details. They reviewed the consent information and indicated agreement before answering the demographic, AI-familiarity, role, perception, and open-ended questions. The quantitative analysis contained no names or direct personal identifiers. Invitation counts and refusals were unavailable; therefore, the response rate and potential nonresponse bias could not be determined.

Ethical considerations

The MSU-IIT University Ethics Review Board reviewed the study through an expedited procedure and granted ethics clearance under UERB-2024-00013. The certification was issued on February 4, 2025, following the submission dated December 5, 2024. Participation was voluntary, and informed consent was obtained from all participants. Participants' responses were handled confidentially. The youngest age group was 18–20 years. All participants were therefore adults at the time of data collection. Accordingly, the study involved adult participants only, and no parental permission was required.

Statistical analysis

Analyses used the 290 complete responses. Frequencies, percentages, means, and standard deviations summarized the sample and study indices. Cronbach's alpha assessed internal consistency; the ethical index was prespecified as exploratory because $\alpha = .581$ fell below conventional and exploratory benchmarks [40]. Levene tests indicated unequal variances for ethical considerations ($p = .016$) and inclusivity ($p = .014$); accordingly, Welch's heteroskedasticity-robust omnibus test and Games-Howell

pairwise comparisons were used for all role comparisons to maintain a consistent robust procedure. Eta squared from the conventional decomposition is included as a descriptive effect-size estimate, with percentile 95% confidence intervals obtained from 10,000 nonparametric bootstrap resamples stratified by role.

Pearson correlations examined bivariate associations. Two ordinary least-squares regressions were then estimated. The first regressed inclusivity on the ethical-considerations index and stakeholder role. The second regressed societal impact on ethical considerations, inclusivity, and stakeholder role. Students were the reference category, represented by administrator and faculty-member indicator variables. Because the Breusch-Pagan test suggested heteroskedasticity in the inclusivity model ($p = .019$), HC3 heteroskedasticity-robust standard errors and confidence intervals were used for both models. Variance-inflation factors ranged from 1.02 to 1.46, indicating no problematic multicollinearity. Statistical significance was evaluated at $\alpha = .05$. The term predictor is used in its statistical, not causal, sense.

Results

Descriptive results and stakeholder comparisons

Across the full sample, perceptions were moderately positive for ethical considerations ($M = 3.47$, $SD = 0.63$), inclusivity ($M = 3.62$, $SD = 0.73$), and societal impact ($M = 3.73$, $SD = 0.65$). Administrators reported the highest societal-impact mean, while faculty members reported the lowest means on all three indices (Table 3).

Table 3
Study-index scores by stakeholder role and Welch omnibus tests

Index	Administrators M (SD)	Students M (SD)	Faculty M (SD)	Welch F (df1, df2)	p	η^2 [95% CI]
Ethical considerations	3.49 (0.65)	3.52 (0.56)	3.31 (0.75)	2.05 (2, 84.27)	.135	.018 [.001, .072]
Inclusivity	3.66 (0.73)	3.72 (0.65)	3.31 (0.88)	6.02 (2, 84.56)	.004	.054 [.014, .126]
Perceived societal impact	4.04 (0.60)	3.71 (0.58)	3.59 (0.79)	6.19 (2, 86.41)	.003	.042 [.011, .103]

Note. Group sizes were 40 administrators, 185 students, and 65 faculty members. η^2 confidence intervals are percentile intervals based on 10,000 nonparametric bootstrap resamples stratified by role. Institutional population benchmarks and a response rate were unavailable; these groups are not claimed to be proportionally representative.

The Welch test found no statistically significant role difference in ethical considerations, $p = .135$. Because the ethical index had modest reliability, this non-significant result should not be interpreted as evidence that the groups were equivalent; measurement error may have reduced precision. Significant role differences were found in inclusivity, $p = .004$, and societal impact, $p = .003$. Games-Howell comparisons showed that students rated inclusivity higher than faculty members (mean difference = 0.41, $p = .002$). The administrator-faculty comparison did not meet the .05 threshold under the heteroskedasticity-robust procedure ($p = .073$), and administrators and students did not differ ($p = .872$).

For perceived societal impact, administrators scored higher than students (mean difference = 0.33, $p = .008$) and faculty members (mean difference = 0.44, $p = .004$). Students and faculty members did not differ significantly ($p = .522$). Games–Howell comparisons were used because the equal-variance assumption was not consistently supported.

Table 4
Games-Howell comparisons for indices with significant Welch tests

Outcome	Comparison	Mean difference	95% CI	p
Inclusivity	Administrators - Students	-0.06	[-0.36, 0.24]	.872
	Administrators - Faculty	0.35	[-0.03, 0.73]	.073
	Students - Faculty	0.41	[0.13, 0.70]	.002
Perceived societal impact	Administrators - Students	0.33	[0.08, 0.58]	.008
	Administrators - Faculty	0.44	[0.12, 0.77]	.004
	Students - Faculty	0.12	[-0.14, 0.37]	.522
<i>Note. Games-Howell pairwise comparisons are reported. Positive differences indicate that the first listed group had the higher mean.</i>				

Associations among study indices

All three indices were positively correlated (Table 5). More positive ethical-consideration ratings were associated with greater perceived inclusivity ($r = .539$, $p < .001$) and societal impact ($r = .459$, $p < .001$). Inclusivity was also associated with societal impact ($r = .570$, $p < .001$). These moderate correlations indicate related but nonidentical patterns of perception; they do not establish causal direction.

Table 5
Pearson correlations among study indices

Index	1	2	3
1. Ethical considerations	—		
2. Inclusivity	.539***	—	
3. Perceived societal impact	.459***	.570***	—
<i>Note. N = 290. ***p < .001.</i>			

Role-adjusted regression models

The role-adjusted model for inclusivity was significant, $F(3, 286) = 44.05$, $p < .001$, $R^2 = .316$, adjusted $R^2 = .309$. More positive ethical-consideration ratings were associated with higher inclusivity ($B = .607$, HC3 SE = .063, $\beta = .517$, $p < .001$). Because this predictor was measured with $\alpha = .581$, its coefficient is exploratory and may be attenuated or otherwise unstable because of measurement error. After ethical considerations were held constant, faculty members had lower inclusivity ratings than students ($B = -.289$, $p = .002$), whereas administrators did not differ from students.

The societal-impact model was also significant, $F(4, 285) = 46.13$, $p < .001$, $R^2 = .393$, adjusted $R^2 = .384$. Inclusivity had the largest standardized association with societal impact ($B = .411$, HC3 SE = .055, $\beta = .466$, $p < .001$). Ethical considerations remained independently associated with societal impact ($B = .221$, HC3 SE = .067, $\beta = .213$, $p = .001$), although this coefficient is provisional because the index is subject to greater measurement error than the other scales. Administrators reported higher societal-impact ratings than students after the two perception indices were held constant ($B = .359$, $p < .001$); faculty members did not differ significantly from students.

Table 6
Role-adjusted regressions with HC3 robust standard errors

Outcome / predictor	B	HC3 SE	β	Robust p	95% robust CI
Inclusivity ($R^2 = .316$)					
Intercept	1.586	.231	—	< .001	[1.133, 2.040]
Ethical considerations	.607	.063	.517	< .001	[.484, .731]
Administrator	– .048	.112	– .022	.670	[-.267, .172]
Faculty member	– .289	.095	– .165	.002	[-.475, – .104]
Perceived societal impact ($R^2 = .393$)					
Intercept	1.402	.199	—	< .001	[1.013, 1.791]
Ethical considerations	.221	.067	.213	.001	[.089, .352]
Inclusivity	.411	.055	.466	< .001	[.303, .518]
Administrator	.359	.094	.192	< .001	[.175, .543]
Faculty member	.099	.082	.064	.226	[-.061, .260]
<i>Note. N = 290. Student was the reference group. β denotes the standardized coefficient. HC3 standard errors were used because of evidence of heteroskedasticity.</i>					

Discussion

This exploratory study examined university stakeholders' ratings of ethical considerations, inclusivity, and perceived societal impact. Three findings emerged. First, respondents generally provided moderately positive ratings, although faculty members were more reserved about inclusivity than students. Second, administrators expressed more positive perceived-societal-impact ratings than students and faculty members. Third, ethical-consideration and inclusivity ratings were moderately associated with perceived societal impact, with inclusivity showing the stronger independent association. These findings describe patterns in the study sample and should not be interpreted as effects of objectively measured AI practices.

Ethical considerations and inclusivity

The association between ethical considerations and inclusivity suggests that stakeholders who perceive AI use as more ethically responsible also tend to regard it as more inclusive. This pattern is consistent with responsible-AI frameworks in which fairness, transparency, privacy, and accountability provide conditions for legitimate educational participation [10], [11], [41]. In educational settings, trust in data

practices and decision processes may influence whether learners and educators view AI-supported systems as acceptable for diverse users.

Nevertheless, the ethical-considerations index had modest internal consistency. It may combine several distinct concerns rather than measure a single homogeneous construct. The positive coefficient should therefore be interpreted as an exploratory association with a brief broad index, not as evidence that a validated ethical-AI latent construct causes inclusivity. Future instrument development should define the domains separately, use multiple items for privacy, fairness, transparency, and governance, and test the resulting measurement structure before estimating their unique effects.

Inclusivity and perceived societal impact

Inclusivity had the largest independent association with perceived societal impact. Stakeholders may judge AI's broader social value partly through whether its educational use appears to expand participation and respond to learner diversity. In the Philippine setting, this judgment cannot be separated from access to reliable connectivity, electricity, suitable devices, accessible interfaces, and technical support. Recent Philippine IT-education scholarship identifies limited resources, infrastructure, expertise, digital literacy, and digital equity as persistent conditions shaping AI integration [39]. The observed association may therefore reflect both pedagogical design and underlying resource access; the present measure cannot disentangle them. This cautions institutions against equating innovation with inclusion.

Ethical considerations remained independently associated with societal impact after inclusivity and role were taken into account. Broader social legitimacy may therefore involve both the perceived inclusiveness of educational experience and confidence that AI is governed responsibly. However, the cross-sectional design cannot determine whether ethical confidence shapes societal evaluations, whether optimistic societal evaluations influence ethical judgments, or whether both reflect a broader orientation toward technology.

Stakeholder differences

Faculty members' lower inclusivity ratings may reflect direct awareness of uneven student access, variable AI literacy, assessment challenges, and the practical work of integrating emerging tools into instruction. Studies of academic staff describe both productivity benefits and concerns involving accuracy, ethics, changing professional roles, preparedness, and institutional guidance [37], [42], [43]. These concerns may resemble professional AI anxiety or skepticism, but the present survey did not measure AI anxiety directly; it therefore cannot establish that anxiety explains the faculty difference. Administrators' higher societal-impact ratings may instead reflect institutional planning, innovation priorities, and a broader strategic perspective. These explanations remain interpretations rather than measured mechanisms, but the observed differences indicate that institutional AI policy should not be based on a single stakeholder viewpoint. Related work shows that academics' and students' adoption decisions are shaped by perceived ethics and academic integrity [44], [45]. AI-mediated systems are also changing teacher–student communication and evaluation practices [46].

Participatory governance may help align institutional strategy with classroom realities. Higher-education policy scholarship recommends involving faculty and students in AI-policy development and providing transparent guidance, professional learning, and ongoing ethical review [30], [47], [48]. Institutions should translate these principles into accessible tools, meaningful alternatives, transparent data-use communication, and mechanisms for reporting bias or exclusion. Comparative analyses of global ethics policies further underscore the need to translate broad principles into institution-level rules and accountable practices [49].

Theoretical and practical implications

The findings support treating ethical considerations, inclusivity, and perceived societal impact as three related dimensions of stakeholder evaluation. Conceptually, they represent responsible use, participation and access, and perceived wider consequences, respectively. Their moderate correlations indicate statistical association without establishing construct validity, empirical identity, or causal ordering.

For practice, the findings favour an integrated institutional approach. Governance mechanisms such as privacy safeguards, clear responsibility, transparency, and bias review should be accompanied by inclusive design and implementation. This approach also requires scrutiny of whether ostensibly beneficial AI applications actually serve educational and social goods in context [50]. Inclusive design must cover low-bandwidth access, intermittent power, device limitations, disability access, language, cost, and the option to complete learning tasks without compulsory reliance on a commercial AI system. Philippine studies identify institutional and infrastructural conditions that make these measures especially relevant [38], [39]. Based on these conditions, institutions should conduct accessibility audits, user testing with diverse stakeholders, faculty consultation, AI-literacy programmes, infrastructure assessment, offline or low-data alternatives, and periodic equity reviews.

Limitations and directions for future research

Several limitations substantially qualify the conclusions. The purposive sample came from one Philippine university, and students constituted nearly two thirds of respondents; transferability and subgroup precision are therefore limited. Invitation counts, response rate, recruitment-channel details, data-collection dates, and institutional population benchmarks were unavailable, preventing evaluation of representativeness and nonresponse bias. Familiarity responses, selected AI tools, and frequency of use were not analyzed, so differences by type or intensity of AI experience could not be examined. Stakeholder classification did not capture possible overlap between teaching and administrative responsibilities. Age was categorical, and the “below 20” band did not distinguish respondents aged 18–19 from any younger participant. The study measured ratings rather than observed accessibility, fairness, educational outcomes, or societal effects of specified AI systems.

All measures were collected through the same self-report questionnaire at one time, creating possible common-method bias and preventing causal inference. The ethical-considerations index had low internal consistency, while the available questionnaire documentation did not establish the factor structure,

convergent validity, or discriminant validity of the indices. The apparent relationships may consequently be attenuated, inflated, or partly attributable to shared response tendencies.

Future studies should develop and validate multi-item scales for distinct ethical domains and inclusive-design features; define the AI system or use case being evaluated; measure participants' frequency and type of AI use; retain invitation and response records; recruit probability or multi-institutional samples; and combine surveys with interviews, usability testing, accessibility audits, and policy analysis. Comparative analysis of institutional policies and national-level Philippine AI strategies is also needed to connect campus experience with the wider governance environment identified by Asio and Soriano [38]. Longitudinal or intervention studies are required before claims about causal effects or mechanisms can be supported.

Conclusion

Within this exploratory single-institution sample, stakeholders provided moderately positive ratings of ethical considerations, inclusivity, and perceived societal impact, with differences by institutional role. Students rated inclusivity higher than faculty members, while administrators reported more positive perceived-societal-impact ratings than both students and faculty members. Ethical-consideration ratings were associated with inclusivity, and both indices were associated with perceived societal impact after role was statistically controlled.

These findings support AI governance that connects institutional ethics with stakeholders' lived educational experiences. At the same time, the evidence does not justify claims that particular ethical or design features cause acceptance or inclusion. The ethical measure requires further development, and the purposive single-institution sample cannot be assumed to represent Philippine HEIs with different infrastructure, resources, populations, or policies. Responsible AI in higher education should therefore be pursued as an iterative, participatory process in which ethical safeguards, inclusive implementation, infrastructure readiness, and empirical evaluation develop together.

Declarations

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Author contributions

J.J.G.A. and V.A.M. conceptualized the study. J.J.G.A., V.A.M., V.S.R., and M.A.S.-H. developed the methodology. J.J.G.A., G.V.C.S., and A.C.S. conducted the investigation and curated the data. V.A.M., V.S.R., and M.A.S.-H. performed and validated the formal analysis. J.J.G.A. and V.A.M. prepared the

original draft. V.A.M., V.S.R., M.A.S.-H., G.V.C.S., and A.C.S. reviewed and edited the manuscript. V.S.R., M.A.S.-H., and A.C.S. provided supervision. All authors reviewed and approved the final manuscript.

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Ethics approval

The study received expedited ethics approval from the University Ethics Review Board of Mindanao State University–Iligan Institute of Technology (MSU-IIT; approval UERB-2024-00013; certification issued February 4, 2025). The University Ethics Review Board is supported by the MSU-IIT Research Integrity and Compliance Office (RICO). All procedures involving human participants were conducted in accordance with the MSU-IIT Research Code of Ethics and the requirements of the University Ethics Review Board specified in the approval.

Consent to participate

All participants received information on the study purpose, procedures, potential risks and benefits, voluntary participation, confidentiality, and withdrawal before taking part. Freely given informed consent to participate was obtained from each participant before completion of the questionnaire. All participants were aged 18 years or older; no participants under 16 years of age were included, so parental or guardian informed consent was not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing financial or non-financial interests.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request, subject to the conditions of the ethics approval and applicable privacy protections.

References

1. Crompton H, Burke D. Artificial intelligence in higher education: The state of the field, *International Journal of Educational Technology in Higher Education*, vol. 20, Art. no. 22, 2023, <https://doi.org/10.1186/s41239-023-00392-8>
2. Zawacki-Richter O, Marín VI, Bond M, Gouverneur F. Systematic review of research on artificial intelligence applications in higher education—Where are the educators? *International Journal of Educational Technology in Higher Education*, vol. 16, Art. no. 39, 2019, <https://doi.org/10.1186/s41239-019-0171-0>
3. Crompton H, Burke D. The educational affordances and challenges of ChatGPT: State of the field, *TechTrends*, vol. 68, pp. 380–392, 2024, <https://doi.org/10.1007/s11528-024-00939-0>
4. Grassini S. Shaping the future of education: Exploring the potential and consequences of AI and ChatGPT in educational settings. *Educ Sci.* 2023;13. <https://doi.org/10.3390/educsci13070692>. 7, Art. 692.
5. Kasneci E et al. ChatGPT for good? On opportunities and challenges of large language models for education, *Learning and Individual Differences*, vol. 103, Art. no. 102274, 2023, <https://doi.org/10.1016/j.lindif.2023.102274>
6. Lo CK. What is the impact of ChatGPT on education? A rapid review of the literature, *Education Sciences*, vol. 13, no. 4, Art. no. 410, 2023, <https://doi.org/10.3390/educsci13040410>
7. Tlili A et al. What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education, *Smart Learning Environments*, vol. 10, Art. no. 15, 2023, <https://doi.org/10.1186/s40561-023-00237-x>
8. Roméro M, Reyes J, Kostakos P. Generative artificial intelligence in higher education. in *Creative Applications of Artificial Intelligence in Education*. Cham, Switzerland: Springer; 2024. pp. 129–43. https://doi.org/10.1007/978-3-031-55272-4_10.
9. Webber KL, Zheng H. Artificial intelligence and advanced data analytics: Implications for higher education, *New Directions for Higher Education*, vol. 2024, no. 207, pp. 5–13, 2024. <https://doi.org/10.1002/he.20508>
10. Floridi L, Cowls J. A unified framework of five principles for AI in society. *Harv Data Sci Rev.* 2019;1(1). <https://doi.org/10.1162/99608f92.8cd550d1>.
11. Nguyen A, Ngo HN, Hong Y, Dang B, Nguyen BPT. Ethical principles for artificial intelligence in education. *Educ Inform Technol.* 2023;28:4221–41. <https://doi.org/10.1007/s10639-022-11316-w>.
12. Yan Y, Liu H, Chau T. A systematic review of AI ethics in education. *J Global Inform Manage.* 2025;33(1):1–50. <https://doi.org/10.4018/JGIM.386381>.
13. Akgün S, Greenhow C. Artificial intelligence in education: Addressing ethical challenges in K–12 settings, *AI and Ethics*, vol. 2, no. 3, pp. 431–440, 2022, <https://doi.org/10.1007/s43681-021-00096-7>

14. Bender EM, Gebru T, McMillan-Major A, Shmitchell S. On the dangers of stochastic parrots: Can language models be too big? in Proc. 2021 ACM Conf. Fairness, Accountability, and Transparency, 2021, pp. 610–623. <https://doi.org/10.1145/3442188.3445922>
15. Filgueiras F. Artificial intelligence and education governance, *Education, Citizenship and Social Justice*, vol. 19, no. 3, pp. 349–361, 2024, <https://doi.org/10.1177/17461979231160674>
16. Qin A, Yang J, Xu X, Zhang Y, Zhang H. Decoding AI ethics from users' lens in education: A systematic review. *Heliyon*. 2024;10. <https://doi.org/10.1016/j.heliyon.2024.e39357>. 20, Art. no. e39357.
17. Richards D, Dignum V. Supporting and challenging learners through pedagogical agents: Addressing ethical issues through designing for values. *Br J Edu Technol*. 2019;50(6):2885–901. <https://doi.org/10.1111/bjet.12863>.
18. Cotton DRE, Cotton PA, Shipway JR. Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations Educ Teach Int*. 2024;61(2):228–39. <https://doi.org/10.1080/14703297.2023.2190148>.
19. McGinty JM. Ethical frameworks of artificial intelligence for faculty: Upholding academic integrity and authenticity, *New Directions for Adult and Continuing Education*, vol. 2025, no. 188, pp. 15–23, 2025. <https://doi.org/10.1002/ace.70012>
20. European, Commission. Ethical Guidelines on the Use of Artificial Intelligence (AI) and Data in Teaching and Learning for Educators. Luxembourg: Publications Office of the European Union; 2022. <https://doi.org/10.2766/153756>.
21. Holmes W, et al. Ethics of AI in education: Towards a community-wide framework. *Int J Artif Intell Educ*. 2022;32:504–26. <https://doi.org/10.1007/s40593-021-00239-1>.
22. Miao F, Cukurova M. AI Competency Framework for Teachers. Paris, France: UNESCO; 2024. <https://doi.org/10.54675/ZJTE2084>.
23. UNESCO, Recommendation on the Ethics of Artificial Intelligence. Paris, France: UNESCO, 2021, <https://doi.org/10.54675/MQIZ1583>
24. Miao F, Holmes W. Guidance for Generative AI in Education and Research. Paris, France: UNESCO; 2023. <https://doi.org/10.54675/EWZM9535>.
25. Tadimalla SY, Maher ML. AI literacy as a core component of AI education. *AI Magazine*. 2025;46. <https://doi.org/10.1002/aaai.70007>. 2, Art. no. e70007.
26. Walter Y. Embracing the future of artificial intelligence in the classroom: The relevance of AI literacy, prompt engineering, and critical thinking in modern education, *International Journal of Educational Technology in Higher Education*, vol. 21, Art. no. 15, 2024, <https://doi.org/10.1186/s41239-024-00448-3>
27. Global Education Monitoring Report Team, Global Education Monitoring Report 2023. Technology in Education—A Tool on Whose Terms? Paris. France: UNESCO; 2023. <https://doi.org/10.54676/UZQV8501>.

28. Rao G, Suhasini N. Integrating artificial intelligence in higher education to enhance teaching and learning. *Comput Appl Eng Educ.* 2025;33(6). <https://doi.org/10.1002/cae.70085>.
29. Al-Zahrani AM, Alasmari TM. Exploring the impact of artificial intelligence on higher education: The dynamics of ethical, social, and educational implications, *Humanities and Social Sciences Communications*, vol. 11, Art. no. 912, 2024, <https://doi.org/10.1057/s41599-024-03432-4>
30. Humble N. Higher education AI policies—A document analysis of university guidelines, *European Journal of Education*, vol. 60, no. 3, Art. no. e70214, 2025, <https://doi.org/10.1111/ejed.70214>
31. Liu Y, Tinmaz H. Navigating AI regulations in higher education: A comparative analysis of mainland China, Hong Kong and Macau. *High Educ Q.* 2025;79. <https://doi.org/10.1111/hequ.70073>. 4, Art. no. e70073.
32. Chan CKY, Hu W. Students' voices on generative AI: Perceptions, benefits, and challenges in higher education, *International Journal of Educational Technology in Higher Education*, vol. 20, Art. no. 43, 2023, <https://doi.org/10.1186/s41239-023-00411-8>
33. Alkire L, Bilgihan A, Bui M, Buoye A, Doğan S, Kim S. RAISE: Leveraging responsible AI for service excellence. *J Service Manage.* 2024;35(4):490–511. <https://doi.org/10.1108/JOSM-11-2023-0448>.
34. Shneiderman B, *Human-Centered AI*, Oxford UK. Oxford University Press, 2022, ISBN: 978-0-19-284529-0.
35. Azevedo L. Institutional policies on artificial intelligence in higher education: Frameworks and best practices for faculty, *New Directions for Adult and Continuing Education*, vol. 2025, no. 188, pp. 70–78, 2025. <https://doi.org/10.1002/ace.70013>
36. Wilson T. The development of policies on generative artificial intelligence in UK universities. *IFLA J.* 2025;51(3):722–34. <https://doi.org/10.1177/03400352251333796>.
37. Giray L, et al. Use and impact of artificial intelligence in Philippine higher education: Reflections from instructors and administrators. *Internet Ref Serv Q.* 2024;28(3):315–38. <https://doi.org/10.1080/10875301.2024.2352746>.
38. Asio JMR, Soriano IDP. The state of artificial intelligence (AI) use in higher education institutions (HEIs) in the Philippines. In: Mobo F, editor. *Impacts of AI on Students and Teachers in Education 5.0*. Hershey, PA, USA: IGI Global; 2025. pp. 523–52. <https://doi.org/10.4018/979-8-3693-8191-5.ch019>.
39. Ortega-Dela Cruz RA, Dela Cruz RZ. AI integration in IT education: Challenges, opportunities, and future directions. *J Teach Learn.* 2025;19(4):6–19. <https://doi.org/10.22329/jtl.v19i4.9362>.
40. Hair JF, Hult GTM, Ringle CM, Sarstedt M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 3rd ed. Thousand Oaks, CA, USA: SAGE; 2022.
41. Dignum V. The role and challenges of education for responsible AI. *Lond Rev Educ.* 2021;19(1):1–11. <https://doi.org/10.14324/LRE.19.1.01>.
42. Doğan ME, Celik I, Arslan H. AI in higher education: Risks and opportunities from the academician perspective. *Eur J Educ.* 2025;60. <https://doi.org/10.1111/ejed.12863>. 1, Art. no. e12863.

43. Slimi Z, Villarejo-Carballido B. Unveiling the potential: Experts' perspectives on artificial intelligence integration in higher education. *Eur J Educational Res.* 2024;13(4):1477–92.
<https://doi.org/10.12973/eu-jer.13.4.1477>.
44. Eldakar M, Shehata A, Ammar A. What motivates academics in Egypt toward generative AI tools? An integrated model of TAM, SCT, UTAUT2, perceived ethics, and academic integrity. *Inform Dev.* 2025;41(3):747–65. <https://doi.org/10.1177/02666669251314859>.
45. Fang X. Research of ethical adoption of college students' learning applications of generative artificial intelligence. *J Comput Assist Learn.* 2025;41(6). <https://doi.org/10.1111/jcal.70146>.
46. Tran H. Rethinking teacher–student communication in the AI era. *Bus Prof Communication Q.* 2025. <https://doi.org/10.1177/23294906251356672>.
47. Chan CKY. A comprehensive AI policy education framework for university teaching and learning, *International Journal of Educational Technology in Higher Education*, vol. 20, Art. no. 38, 2023, <https://doi.org/10.1186/s41239-023-00408-3>
48. Ifenthaler D et al. Artificial intelligence in education: Implications for policymakers, researchers, and practitioners, *Technology, Knowledge and Learning*, vol. 29, pp. 1693–1710, 2024, <https://doi.org/10.1007/s10758-024-09747-0>
49. Slimi Z, Villarejo-Carballido B. Navigating the ethical challenges of artificial intelligence in higher education: An analysis of seven global AI ethics policies. *TEM J.* 2023;12(2):590–602.
<https://doi.org/10.18421/TEM122-02>.
50. Pechenkina E. In: Chan CM, Colloton T, Cambridge UK, editors. *Artificial intelligence for good? in Generative AI in Higher Education*. Open Book; 2023. pp. 239–66.
<https://doi.org/10.11647/OBP.0363.09>.