

Factors influencing nursing educators' behavioral intention to adopt artificial intelligence in teaching: A cross-sectional study from Morocco

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ABSTRACT

Purpose: Educators are central to the successful integration of artificial intelligence (AI) in health sciences education, yet evidence from North African contexts remains scarce. This study examined the factors associated with nursing educators' behavioral intention to adopt AI in their teaching practices in Laayoune, Morocco.

Methods: A cross-sectional analytical study was conducted among 108 nursing educators (response rate: 90.8%) between June and July 2025. A French-language, self-administered questionnaire based on the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology measured behavioral intention and ten individual, technological, and organizational dimensions (45 items; Cronbach's $\alpha = 0.835\text{--}0.983$). Behavioral intention, the canonical acceptance outcome in both models, was analyzed as a continuous variable using independent-samples t-tests with effect sizes, Pearson correlations, and multiple linear regression with backward elimination, bootstrap confidence intervals, and a logistic sensitivity analysis.

Results: Behavioral intention was high (per-item mean 4.29 ± 0.53 out of 5), and 94.4% of educators already used AI tools in teaching, despite high anxiety (4.50 ± 0.70), high perceived risk (3.98 ± 0.73), and very low perceived facilitating conditions (2.11 ± 1.27). In the final regression model, awareness ($\beta = 0.556$, $p < 0.001$) and self-efficacy ($\beta = 0.248$, $p = 0.010$) were the only independent predictors, together explaining 57.4% of the variance in intention ($F(2, 105) = 70.62$, $p < 0.001$). The bivariate associations of age, teaching experience, AI knowledge, and AI proficiency with intention were fully accounted for by these two factors.

Conclusion: AI adoption among these nursing educators appears largely individual and self-directed, driven by awareness and confidence rather than institutional support, which was perceived as weak. Strengthening AI literacy and self-efficacy, alongside institutional investment in infrastructure, training, and guidelines, may support responsible AI integration. Findings from this single-institution study should be interpreted with appropriate caution.

Keywords: artificial intelligence, behavioral intention, nursing educators, TAM, UTAUT, Morocco

INTRODUCTION

Artificial intelligence (AI) has rapidly transformed several sectors of society, including education and healthcare. In recent years, AI-based technologies have increasingly been integrated into higher education to support teaching, learning, assessment, and academic decision-making (Dwivedi et al., 2021; Su & Yang, 2022). Applications such as intelligent tutoring systems, virtual simulations, generative AI tools, and natural language processing technologies are reshaping educational environments and creating new opportunities for personalized and adaptive learning (Holmes & Tuomi, 2022).

In nursing and health sciences education, AI is regarded as one of the most promising technological innovations for improving educational quality and preparing future healthcare professionals for rapidly evolving clinical environments (Bozkurt et al., 2021; De Gagne, 2023). AI technologies may support the development of critical thinking, clinical reasoning, and decision-making skills, as well as interactive learning experiences among students in health-related disciplines (Andersen et al., 2022). The recent proliferation of generative AI tools such as ChatGPT, Gemini, and DeepSeek has further accelerated the debate on integrating AI into teaching practices and curriculum development in higher education.

Despite these potential benefits, the implementation of AI in educational settings faces substantial challenges. Ethical concerns, insufficient technological infrastructure, data privacy issues, limited training opportunities, and resistance to

technological change may hinder the successful adoption of AI in teaching practices (De Gagne, 2023). In this context, educators occupy a decisive position: whether AI is integrated effectively, responsibly, and pedagogically depends first on their willingness to adopt it.

Technology adoption has been widely examined through the Technology Acceptance Model (TAM; Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003). In both frameworks, **behavioral intention, defined as an individual's readiness to use a technology, constitutes the proximal outcome of the acceptance process** and the strongest predictor of actual use, shaped by determinants such as perceived usefulness, perceived ease of use, social influence, and facilitating conditions. Beyond these classical determinants, subsequent research on AI in educational contexts has highlighted the roles of awareness, self-efficacy, trust, anxiety, and perceived risk in shaping intentions toward AI (Kelly et al., 2023; Wang et al., 2021). Examining behavioral intention and its determinants as conceptually distinct constructs is essential for producing interpretable evidence on which factors institutions can act.

Although intentions toward AI have been extensively investigated among students (Ma & Lei, 2024), comparatively few studies have focused on educators, and fewer still on nursing and health sciences educators. Evidence from developing countries, and from North African educational contexts in particular, remains limited. In Morocco, where higher education institutions are engaging in digital transformation, research examining nursing educators' intentions to adopt AI is still scarce, even though these educators are the gatekeepers of AI integration into the training of future health professionals.

Therefore, this study examined the factors associated with behavioral intention to adopt AI in teaching among nursing educators at the Higher Institute of Nursing Professions and Health Techniques in Laayoune, Morocco. Specifically, the study aimed to:

1. Describe educators' knowledge of, experience with, and use of AI tools.
2. Assess their level of behavioral intention to adopt AI in their teaching practices.
3. Identify the individual, technological, and organizational factors associated with this intention.

This study contributes to the literature by providing empirical evidence from an underexplored educational and geographical context, using an analytical strategy in which the outcome (behavioral intention) is measured independently of its candidate determinants. The findings may help educational institutions and policymakers understand which factors most strongly shape educators' readiness to adopt AI, and thus where training, support, and governance efforts should be directed in nursing and health sciences education.

MATERIALS AND METHODS

Study Design

A quantitative, analytical cross-sectional study was conducted to identify the factors associated with nursing educators' behavioral intention to adopt artificial intelligence (AI) in their teaching practices. Behavioral intention was selected as the outcome because it constitutes the proximal indicator of technology acceptance in both the Technology Acceptance Model (TAM; Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003), and because defining the outcome independently of the predictor constructs avoids part-whole overlap between the outcome and its determinants.

Study Setting

The study was conducted at the Higher Institute of Nursing Professions and Health Techniques in Laayoune (ISPITS-L), Morocco, between June 15 and July 31, 2025. ISPITS-L is a public higher education institution responsible for training nursing and health sciences professionals in southern Morocco, offering undergraduate and postgraduate programs in nursing sciences, health techniques, midwifery, rehabilitation, and health management. The institution was selected because of the growing integration of digital and AI-related tools into its educational activities and because its educators are key stakeholders in the implementation of AI in health sciences education.

Participants and Sampling

The target population comprised all nursing educators and health sciences instructors teaching at ISPITS-L during the study period. An exhaustive sampling strategy was adopted to maximize participation and reduce selection bias. Permanent and part-time educators actively involved in teaching were eligible; administrative staff not engaged in teaching and educators absent during the data collection period were excluded. Of 119 distributed questionnaires, 108 complete responses were returned (response rate: 90.8%). No item-level missing data were present among the returned questionnaires. With 108 participants and ten candidate predictors, the ratio of observations to predictors in the full regression model was approximately 11:1, which meets the commonly recommended minimum of ten observations per predictor for multiple linear regression, although the modest absolute sample size is acknowledged as a limitation.

Data Collection Instrument

Data were collected using a structured, self-administered questionnaire developed from constructs of the TAM (Davis, 1989) and UTAUT (Venkatesh et al., 2003), complemented by dimensions identified in the literature on AI acceptance in educational contexts, namely awareness, self-efficacy, perceived trust, anxiety, and perceived risk (Kelly et al., 2023; Wang et al., 2021).

The questionnaire comprised two sections: **(1)** sociodemographic characteristics and AI-related knowledge and experience, and **(2)** a multidimensional scale of 45 items distributed across 11 dimensions: attitude (5 items), perceived trust (3), self-efficacy (5), awareness (4), behavioral intention (4), anxiety (5), perceived usefulness (5), perceived ease of use (4), perceived risk (3), social influence (3), and facilitating conditions (4). All items were rated on a five-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree").

The questionnaire was administered in French, the language of instruction at ISPITS-L. Items were adapted from previously published English-language instruments and translated into French by the research team, and the French version was reviewed by experts in nursing education for content clarity, relevance, and cultural appropriateness. No formal back-translation was performed, which is acknowledged as a limitation. Before final administration, the questionnaire was pilot-tested with a small group of educators to assess item clarity, comprehension, and completion time; pilot respondents were not included in the final analyses.

Study Variables

Outcome variable

The outcome was behavioral intention to adopt AI in teaching, measured as the sum of the four behavioral intention items (theoretical range 4–20), with higher scores indicating stronger intention. Behavioral intention was analyzed as a continuous variable in the primary analyses to preserve statistical information and avoid arbitrary categorization. This operationalization ensures complete statistical independence between the outcome and the predictor constructs, as none of the predictor dimensions contributes items to the outcome score.

Independent variables

Predictors comprised (a) individual factors: attitude, awareness, self-efficacy, perceived trust, and anxiety; (b) technological factors: perceived usefulness, perceived ease of use, and perceived risk; (c) organizational factors: social influence and facilitating conditions; and (d) sociodemographic and AI-related experience variables (age group, gender, employment status, professional background, teaching experience, AI knowledge level, AI tool proficiency, continuous AI training, use of AI tools in teaching, and frequency of AI tool use). Each dimension score was computed as the sum of its items. All dimensions, including anxiety and perceived risk, were scored in the direction of their construct, with higher scores indicating higher levels of the construct concerned (e.g., greater anxiety, greater perceived risk). Field of practice was a multiple-response variable and was therefore described but excluded from inferential analyses.

Psychometric Properties

Internal consistency was assessed for each dimension using Cronbach's alpha, with values ≥ 0.70 considered acceptable. Item-level homogeneity was examined using corrected item–rest correlations, in which each item is correlated with the sum of the remaining items of its own dimension, thereby avoiding the inflation that occurs when an item is correlated with a total to which it contributes. A single global alpha was not emphasized because the instrument is explicitly multidimensional, and a global coefficient computed across heterogeneous constructs is not readily interpretable. Full construct validation using exploratory or confirmatory factor analysis was beyond the scope of this study given the sample size, and is acknowledged as a limitation.

Data Analysis

Analyses were performed using IBM SPSS Statistics version 26. Categorical variables were summarized as frequencies and percentages, and continuous variables as means and standard deviations. The distribution of the behavioral intention score was examined using skewness, kurtosis, and the Shapiro–Wilk test.

Bivariate associations between behavioral intention and categorical participant characteristics were tested using independent-samples t-tests; homogeneity of variances was verified with Levene's test, and all group comparisons were additionally verified with Mann–Whitney U tests given the bounded, discrete nature of the outcome. Test statistics, degrees of freedom, exact p-values, and Cohen's d effect sizes are reported for all comparisons. Associations between behavioral intention and the ten predictor dimensions were quantified with Pearson correlation coefficients and verified with Spearman rank correlations.

Multivariable analysis proceeded in two steps. First, a full multiple linear regression model including all ten predictor dimensions was estimated for transparency, with unstandardized coefficients (B), standard errors, standardized coefficients (β), 95% confidence intervals, R^2 , adjusted R^2 , and the model F test reported. Multicollinearity was assessed using tolerance and variance inflation factors (VIF), with $VIF < 5$ considered acceptable. Second, a parsimonious final model was obtained by backward elimination with a retention criterion of $p < 0.05$. Residuals of the final model were inspected for normality (Shapiro–Wilk) and homoscedasticity; because residual normality was borderline, 95% percentile bootstrap confidence intervals (5,000 resamples) were computed for the final model coefficients. To verify that conclusions did not depend on the linear specification, a sensitivity analysis was conducted using binary logistic regression with behavioral intention dichotomized at the sample median. Sociodemographic and experience variables associated with behavioral intention in bivariate analyses were tested as additional covariates in the final model. Statistical significance was set at $p < 0.05$ (two-tailed).

Ethical Considerations

The study was approved by the Ethics Committee of the Higher Institute of Nursing Professions and Health Techniques in Laayoune on April 13, 2025 (approval code: PSITS-4-2025-E16). Participation was voluntary, and written informed consent was

Table 1. Internal consistency of the measurement scale (N = 108)

Dimension	Items	Cronbach's α	Corrected item–rest correlations
Attitude	5	0.878	0.558–0.801
Perceived Trust	3	0.969	0.924–0.940
Self-efficacy	5	0.906	0.689–0.830
Awareness	4	0.835	0.642–0.701
Behavioral Intention	4	0.867	0.632–0.776
Anxiety	5	0.966	0.878–0.944
Perceived Usefulness	5	0.912	0.741–0.819
Perceived Ease of Use	4	0.848	0.638–0.724
Perceived Risk	3	0.926	0.801–0.892
Social Influence	3	0.961	0.886–0.933
Facilitating Conditions	4	0.983	0.953–0.962

Table 2. Sociodemographic characteristics of the participants (N = 108)

Variable	Category	Frequency (N)	Percentage (%)
Age	Under 29 years	16	14.8
	30–39 years	61	56.5
	40–49 years	25	23.1
	50 years and over	6	5.6
Gender	Male	45	41.7
	Female	63	58.3
Employment status	Permanent educator	61	56.5
	Part-time educator	47	43.5
Professional Background	Professor/researcher	20	18.5
	Nurse and health technician	68	63.0
	Doctor	11	10.2
	Administrator	8	7.4
	Other	1	0.9
Teaching Experience	≤ 5 years	80	74.1
	6–10 years	22	20.4
	11–15 years	4	3.7
	≥ 16 years	2	1.9
Field of practice*	Nursing care	83	76.9
	Health techniques	38	35.2
	Rehabilitation	34	31.5
	Midwifery	43	39.8
	Medical-social assistance	23	21.3
	Master PSITS ¹ and MQSS ²	9	8.3

* Multiple-response variable; percentages do not sum to 100%.

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obtained from all participants. Data confidentiality and anonymity were strictly maintained, and the data were used exclusively for research purposes.

RESULTS

Psychometric Properties of the Questionnaire

All eleven dimensions demonstrated satisfactory internal consistency, with Cronbach's alpha coefficients ranging from 0.835 (awareness) to 0.983 (facilitating conditions) (**Table 1**). Corrected item–rest correlations, in which each item was correlated with the sum of the remaining items of its own dimension, ranged from 0.558 to 0.962 and were all positive, supporting item homogeneity within each construct. It should be noted that four dimensions (perceived trust, anxiety, social influence, and facilitating conditions) showed alpha values above 0.95, which may indicate some redundancy among their items.

Characteristics of the Participants

A total of 108 nursing educators participated in the study, corresponding to a response rate of 90.8%. The majority of participants were aged between 30 and 39 years (56.5%), followed by those aged between 40 and 49 years (23.1%). Female participants represented 58.3% of the sample.

Regarding professional status, 56.5% were permanent educators and 43.5% were part-time educators. Most participants had a nursing or health sciences background (63.0%), whereas 18.5% were professor-researchers and 10.2% were doctors.

With respect to teaching experience, nearly three-quarters of the participants (74.1%) reported five years or less of teaching experience. Participants were involved in several educational programs and disciplines within the institution, reflecting the multidisciplinary nature of health sciences education (**Table 2**).

Table 3. Descriptive statistics of the measurement dimensions (N = 108)

Dimension	Items	Sum score, M ± SD	Per-item mean (1–5), M ± SD
Attitude	5	21.70 ± 2.45	4.34 ± 0.49
Perceived Trust	3	10.47 ± 3.45	3.49 ± 1.15
Self-efficacy	5	21.59 ± 2.76	4.32 ± 0.55
Awareness	4	17.10 ± 2.11	4.28 ± 0.53
Behavioral Intention	4	17.17 ± 2.12	4.29 ± 0.53
Anxiety	5	22.49 ± 3.52	4.50 ± 0.70
Perceived Usefulness	5	21.25 ± 2.47	4.25 ± 0.49
Perceived Ease of Use	4	16.98 ± 2.08	4.25 ± 0.52
Perceived Risk	3	11.95 ± 2.18	3.98 ± 0.73
Social Influence	3	12.10 ± 2.44	4.03 ± 0.81
Facilitating Conditions	4	8.44 ± 5.06	2.11 ± 1.27

Note: All dimensions, including anxiety and perceived risk, are scored in the direction of their construct (higher scores = higher levels of the construct concerned).

Table 4. Behavioral intention score according to sociodemographic characteristics (N = 108)

Variable	Category (n)	BI score, M ± SD	t (df = 106)	p	Cohen's d
Age	< 40 years (77)	17.65 ± 1.83	3.97	< 0.001	0.84
	≥ 40 years (31)	15.97 ± 2.36			
Gender	Male (45)	17.13 ± 2.20	-0.14	0.891	0.03
	Female (63)	17.19 ± 2.09			
Employment status	Permanent (61)	17.00 ± 2.10	-0.93	0.355	0.18
	Part-time (47)	17.38 ± 2.16			
Professional Background	Nursing/health tech. (68)	17.22 ± 2.09	0.34	0.733	0.07
	Other backgrounds† (40)	17.07 ± 2.20			
Teaching Experience	≤ 5 years (80)	17.52 ± 2.01	3.08	0.003	0.68
	> 5 years (28)	16.14 ± 2.16			

† Professor-researchers, doctors, administrators, and other profiles. Independent-samples t-tests; equal variances confirmed by Levene's test; conclusions confirmed by Mann-Whitney U tests.

Regarding AI-related experience, most participants reported a medium or advanced level of AI knowledge (61.1%) and a medium or expert level of proficiency with AI tools (54.6%), although only 26.9% had received continuous training on AI. Almost all participants (94.4%) reported using AI tools in their teaching practices, but only 35.3% of users did so frequently ("always" or "often").

Descriptive Statistics of the Measurement Dimensions

Table 3 presents the descriptive statistics of the eleven dimensions. Behavioral intention was high (per-item mean 4.29 ± 0.53 on the 1–5 scale; sum score 17.17 ± 2.12 , median 17, observed range 12–20). Attitude, self-efficacy, awareness, perceived usefulness, and perceived ease of use were also high (per-item means ≥ 4.25). Notably, anxiety (4.50 ± 0.70) and perceived risk (3.98 ± 0.73) were likewise elevated, indicating that favorable intentions coexisted with substantial concerns. Facilitating conditions received by far the lowest ratings (2.11 ± 1.27), indicating that participants perceived little institutional support, infrastructure, or resources for AI use. The distribution of the behavioral intention score departed from normality (Shapiro-Wilk $p < 0.001$; skewness -0.34); parametric results were therefore verified with nonparametric tests throughout.

Behavioral Intention According to Participant Characteristics

Behavioral intention differed significantly by age and teaching experience (**Table 4**). Educators younger than 40 years reported higher intention than those aged 40 years and older (17.65 ± 1.83 vs. 15.97 ± 2.36 ; $t(106) = 3.97$, $p < 0.001$, $d = 0.84$), and educators with five years or less of teaching experience reported higher intention than their more experienced colleagues (17.52 ± 2.01 vs. 16.14 ± 2.16 ; $t(106) = 3.08$, $p = 0.003$, $d = 0.68$). No significant differences were observed by gender, employment status, or professional background (all $p > 0.35$, all $d \leq 0.18$). Levene's tests indicated homogeneous variances for all comparisons (all $p > 0.05$), and Mann-Whitney U tests confirmed every conclusion.

Behavioral intention was also significantly associated with AI knowledge, proficiency, and use (**Table 5**). Participants with medium or advanced AI knowledge reported higher intention than those with basic or no knowledge ($t(106) = 3.30$, $p = 0.001$, $d = 0.65$), as did participants with higher proficiency in AI tools ($t(106) = 4.11$, $p < 0.001$, $d = 0.80$). Educators who used AI tools in their teaching reported higher intention than the small group of non-users ($t(106) = 3.31$, $p = 0.001$, $d = 1.39$; Mann-Whitney $p = 0.008$), although the size of the non-user group ($n = 6$) warrants caution. Among users, frequent users reported higher intention than infrequent users ($t(100) = 3.39$, $p = 0.001$, $d = 0.70$). Participation in continuous AI training was not associated with behavioral intention ($p = 0.826$).

Table 5. Behavioral intention score according to AI knowledge and experience (N = 108)

Variable	Category (n)	BI score, M $\pm$ SD	t (df)	p	Cohen's d
AI Knowledge Level	High [†] (66)	17.68 $\pm$ 1.90	3.30 (106)	0.001	0.65
	Low [‡] (42)	16.36 $\pm$ 2.23			
AI Tool Proficiency	High [§] (59)	17.88 $\pm$ 1.90	4.11 (106)	< 0.001	0.80
	Low [¶] (49)	16.31 $\pm$ 2.07			
Continuous AI Training	Yes (29)	17.24 $\pm$ 1.86	0.22 (106)	0.826	0.05
	No (79)	17.14 $\pm$ 2.22			
Use of AI Tools in Teaching	Yes (102)	17.32 $\pm$ 2.02	3.31 (106)	0.001	1.39
	No (6)	14.50 $\pm$ 2.35			
Frequency of AI Tool Use*	Frequent [#] (36)	18.19 $\pm$ 2.18	3.39 (100)	0.001	0.70
	Infrequent ^{##} (66)	16.85 $\pm$ 1.76			

[†] Advanced + Medium knowledge.

[§] Expert + Medium proficiency.

* Assessed among AI users only (n = 102).

[‡] Basic + No knowledge.

[¶] Beginner + Poor proficiency.

[#] Always + Often users.

^{##} Sometimes + Rarely users.

Table 6. Correlations between predictor dimensions and behavioral intention (N = 108)

Dimension	Pearson r	p	Spearman p	p
Awareness	0.739	< 0.001	0.708	< 0.001
Self-efficacy	0.658	< 0.001	0.646	< 0.001
Attitude	0.532	< 0.001	0.486	< 0.001
Perceived ease of use	0.518	< 0.001	0.440	< 0.001
Perceived usefulness	0.517	< 0.001	0.489	< 0.001
Social influence	0.386	< 0.001	0.427	< 0.001
Anxiety	-0.273	0.004	-0.168	0.083
Facilitating conditions	-0.193	0.046	-0.252	0.008
Perceived trust	0.187	0.053	0.198	0.040
Perceived risk	-0.018	0.849	-0.065	0.506

Table 7. Full multiple linear regression model of behavioral intention (N = 108)

Predictor	B	SE	β	t	p	95% CI for B	VIF
(Constant)	3.749	2.171	–	1.73	0.087	–0.560 to 8.058	–
Attitude	0.077	0.092	0.089	0.83	0.406	–0.106 to 0.260	2.69
Perceived trust	–0.026	0.046	–0.041	–0.55	0.583	–0.117 to 0.066	1.35
Self-efficacy	0.138	0.089	0.179	1.54	0.126	–0.039 to 0.315	3.21
Awareness	0.484	0.105	0.480	4.61	< 0.001	0.276 to 0.692	2.59
Anxiety	–0.021	0.045	–0.035	–0.48	0.635	–0.110 to 0.068	1.31
Perceived usefulness	–0.004	0.096	–0.005	–0.04	0.966	–0.194 to 0.186	2.96
Perceived ease of use	0.064	0.105	0.062	0.61	0.545	–0.144 to 0.272	2.52
Perceived risk	–0.010	0.068	–0.011	–0.15	0.880	–0.145 to 0.124	1.16
Social influence	0.056	0.071	0.065	0.80	0.427	–0.084 to 0.197	1.57
Facilitating conditions	–0.036	0.030	–0.087	–1.21	0.228	–0.096 to 0.023	1.23

Model: $R^2 = 0.594$; adjusted $R^2 = 0.552$; $F(10, 97) = 14.17$, $p < 0.001$.

Correlations Between the Predictor Dimensions and Behavioral Intention

Awareness showed the strongest correlation with behavioral intention ($r = 0.739$, $p < 0.001$), followed by self-efficacy ($r = 0.658$), attitude ($r = 0.532$), perceived ease of use ($r = 0.518$), perceived usefulness ($r = 0.517$), and social influence ($r = 0.386$) (all $p < 0.001$; **Table 6**). Anxiety was negatively correlated with intention ($r = -0.273$, $p = 0.004$). Facilitating conditions showed a weak negative correlation with intention ($r = -0.193$, $p = 0.046$; Spearman $p = -0.252$, $p = 0.008$), whereas perceived trust showed only a weak, marginal positive association ($r = 0.187$, $p = 0.053$) and perceived risk was unrelated to intention ($r = -0.018$, $p = 0.849$). Spearman correlations corroborated the Pearson results.

Multivariable Analysis

The full multiple linear regression model including all ten predictor dimensions explained a substantial proportion of the variance in behavioral intention ($R^2 = 0.594$, adjusted $R^2 = 0.552$, $F(10, 97) = 14.17$, $p < 0.001$; **Table 7**). All variance inflation factors were below 5 (range 1.16–3.21), indicating no problematic multicollinearity, although the moderate correlations among constructs (up to $r = 0.74$ between awareness and self-efficacy) explain why several dimensions that were significant bivariately did not retain independent effects. In the full model, only awareness was independently associated with behavioral intention ($B = 0.484$, $\beta = 0.480$, $p < 0.001$).

Table 8. Final multiple linear regression model of behavioral intention (N = 108)

Predictor	B	SE	β	t	p	95% CI for B	Bootstrap 95% CI*
(Constant)	3.477	1.165	–	2.98	0.004	1.166 to 5.788	0.841 to 5.782
Awareness	0.560	0.095	0.556	5.87	< 0.001	0.371 to 0.749	0.356 to 0.762
Self-efficacy	0.191	0.073	0.248	2.62	0.010	0.046 to 0.335	0.020 to 0.378

Model: $R^2 = 0.574$; adjusted $R^2 = 0.565$; $F(2, 105) = 70.62$, $p < 0.001$.

* Percentile bootstrap, 5,000 resamples.

Backward elimination (removal criterion $p > 0.05$) produced a parsimonious final model retaining awareness and self-efficacy, which together explained 57.4% of the variance in behavioral intention (adjusted $R^2 = 0.565$, $F(2, 105) = 70.62$, $p < 0.001$; **Table 8**). Awareness was the dominant predictor ($B = 0.560$, $\beta = 0.556$, $p < 0.001$), followed by self-efficacy ($B = 0.191$, $\beta = 0.248$, $p = 0.010$). Because residual normality was borderline (Shapiro–Wilk $p = 0.047$), percentile bootstrap confidence intervals (5,000 resamples) were computed and closely matched the parametric intervals, supporting the stability of the estimates. No evidence of heteroscedasticity was observed.

When the sociodemographic and experience variables associated with intention in bivariate analyses were added individually to the final model, none remained significant (age < 40 years: $B = 0.169$, $p = 0.612$; teaching experience ≤ 5 years: $B = 0.131$, $p = 0.693$; high AI proficiency: $B = 0.342$, $p = 0.252$; high AI knowledge: $B = 0.038$, $p = 0.900$; use of AI tools: $B = -0.352$, $p = 0.600$), suggesting that their bivariate associations with intention were accounted for by awareness and self-efficacy.

Finally, a sensitivity analysis using binary logistic regression with behavioral intention dichotomized at the sample median (≥ 17 , $n = 64$ vs. < 17 , $n = 44$) yielded the same conclusions: the model was significant ($\chi^2(2) = 58.32$, $p < 0.001$; Nagelkerke $R^2 = 0.563$), with awareness (OR = 2.90, 95% CI: 1.60–5.27, $p < 0.001$) and self-efficacy (OR = 1.48, 95% CI: 1.05–2.08, $p = 0.024$) both independently associated with high behavioral intention.

DISCUSSION

This study examined the factors associated with nursing educators' behavioral intention to adopt artificial intelligence (AI) in their teaching practices in Morocco. Overall, behavioral intention was high (per-item mean 4.29 ± 0.53 out of 5), and almost all participants (94.4%) already used AI tools in their teaching. In the final multivariable model, awareness and self-efficacy were the only independent predictors of behavioral intention, together explaining 57.4% of its variance. Notably, this favorable intention coexisted with high levels of anxiety and perceived risk and with very low perceived facilitating conditions, suggesting that AI adoption in this context is currently driven by individual rather than organizational factors.

Educators' Knowledge and Experience With AI

AI knowledge, proficiency with AI tools, and frequency of AI use were all significantly associated with behavioral intention, with moderate to large effect sizes ($d = 0.65$ – 0.80), whereas participation in continuous AI training was not. Familiarity with AI technologies may reduce uncertainty and strengthen educators' confidence, a pattern consistent with previous studies showing that prior experience with digital technologies facilitates technology acceptance in educational settings (Al Darayseh, 2023; Cabero-Almenara et al., 2024; Li et al., 2024).

However, the profile of this familiarity deserves attention. Although 94.4% of participants used AI tools in their teaching, only a small minority reported an advanced level of AI knowledge, and barely one-quarter had received any continuous training on AI. The absence of an association between formal training and intention, combined with near-universal use, suggests that AI adoption among these educators is mainly practical and self-directed rather than grounded in structured professional development. This is particularly consequential in nursing and health sciences education, where using AI appropriately requires not only technical skills but also critical judgment regarding accuracy, ethics, confidentiality, and pedagogical relevance. Structured AI literacy programs therefore appear necessary to help educators move from informal, tool-driven use toward informed, ethical, and pedagogically meaningful integration.

Level of Behavioral Intention

The high level of behavioral intention observed in this study indicates a generally favorable disposition toward AI integration, consistent with previous reports of positive but cautious attitudes toward AI among educators and healthcare professionals (Nja et al., 2023; Alzahrani, 2023; Cabero-Almenara et al., 2024). The growing availability of generative AI tools such as ChatGPT, Gemini, and DeepSeek may partly explain this openness.

What distinguishes the present findings is the configuration in which this intention occurs. Anxiety (4.50 ± 0.70) and perceived risk (3.98 ± 0.73) were both elevated, and facilitating conditions received by far the lowest ratings of all dimensions (2.11 ± 1.27), indicating that educators perceived little institutional support, infrastructure, or dedicated resources. It should be emphasized that anxiety and perceived risk were scored in their natural direction, so these elevated means reflect genuinely high levels of concern rather than an artifact of scoring. In this instrument, the anxiety items capture professional concerns surrounding AI use (worries about algorithmic bias that could disadvantage some students, the collection of personal data, over-dependence on AI tools, and undetected AI errors in an educational context) rather than personal apprehension about operating the tools themselves, and the perceived risk items similarly address ethical issues and the reliability of AI-generated information. In other words, educators intend to use AI, and overwhelmingly already do, despite substantial concerns of this kind and despite an organizational environment they perceive as unsupportive. This pattern suggests a largely bottom-up, individually driven

adoption process. In the Moroccan nursing education context, where AI integration is recent and institutional policies, training programs, and digital infrastructure are still developing, such a configuration should be read as both an opportunity and a warning: the motivational groundwork for AI integration already exists among educators, but in the absence of institutional structuring, adoption may remain informal, heterogeneous, and insufficiently attentive to ethical and pedagogical safeguards.

Sociodemographic Factors and Behavioral Intention

In bivariate analyses, educators younger than 40 years and those with five years or less of teaching experience reported significantly higher behavioral intention, with moderate to large effect sizes. Similar age- and experience-related gradients have been reported in previous studies of educators' openness to digital innovation (Ofosu-Ampong, 2024; Xu et al., 2024). No differences were observed by gender, employment status, or professional background.

Importantly, however, none of these sociodemographic and experience variables remained associated with intention once awareness and self-efficacy were taken into account. This suggests that the apparent advantage of younger and less experienced educators does not reflect age itself but rather their higher levels of AI awareness and confidence, which are modifiable factors. This result carries an encouraging practical message: rather than interpreting lower intention among older or more experienced educators as resistance, institutions can address it through targeted awareness-building and confidence-building interventions adapted to different levels of digital competence.

Key Predictors of Behavioral Intention

Awareness was the dominant independent predictor of behavioral intention ($\beta = 0.556$, $p < 0.001$). Educators who understand what AI is, what it can and cannot do, and how it may be relevant to their professional activities appear far more inclined to adopt it. This finding is consistent with evidence identifying awareness and understanding of AI as key determinants of acceptance in educational contexts (Kelly et al., 2023), and it is theoretically coherent: awareness is plausibly upstream of most other perceptions, since educators can hardly develop stable judgments of usefulness, ease of use, or trust toward technologies they do not understand.

Self-efficacy was the second independent predictor ($\beta = 0.248$, $p = 0.010$). Educators who feel capable of using AI technologies successfully are more likely to intend to adopt them, a finding consistent with Social Cognitive Theory (Bandura, 1986) and with previous studies identifying self-efficacy as an important factor in educators' technology adoption (Nja et al., 2023; Wang et al., 2021). In practical terms, educators with higher AI self-efficacy may be more willing to explore AI tools, experiment with new pedagogical strategies, and persist through technical difficulties.

Non-Significant Factors in the Multivariable Model

Attitude, perceived usefulness, perceived ease of use, social influence, and anxiety were all significantly associated with intention in bivariate analyses but did not retain independent effects in the multivariable model. Given the moderate correlations among constructs, particularly between awareness and self-efficacy on the one hand and the classical TAM constructs on the other, the most plausible interpretation is that the influence of these perceptions on intention largely overlaps with, or operates through, awareness and competence beliefs. This does not mean that perceived usefulness or ease of use are irrelevant; rather, in this early-stage adoption context, they add little predictive information beyond what educators know about AI and how capable they feel of using it.

Perceived trust showed only a weak, marginal bivariate association with intention, and perceived risk showed none, despite both being salient concerns in the literature (Alzyoud et al., 2024; Choi et al., 2023; Velli & Zafiroopoulos, 2024). Similarly, anxiety, although negatively correlated with intention bivariate, was not an independent predictor, a pattern consistent with meta-analytic evidence that anxiety often operates on technology acceptance indirectly, through constructs such as self-efficacy (Dönmez-Turan & Kır, 2019). Taken together, these results suggest that in this sample, negative perceptions did not translate into lower intentions; educators appear to have adopted a pragmatic stance in which concerns about AI coexist with the intention to use it.

Facilitating conditions displayed a weak negative bivariate correlation with intention and no independent effect. This finding contrasts with UTAUT-based studies in which facilitating conditions supported adoption (Alzahrani, 2023; Velli & Zafiroopoulos, 2024). Two contextual elements may explain it. First, in a single institution, variation in facilitating-condition scores reflects differences in individual perception rather than in objective resources; educators who use AI most intensively may be precisely those most aware of the gap between their needs and the available institutional support. Second, when institutional support is uniformly low, as the very low mean suggests, it cannot function as a driver of intention; adoption proceeds despite it, not because of it. This interpretation reinforces, rather than contradicts, the theoretical importance of facilitating conditions: their weakness has not suppressed intention, but it may well constrain the quality, consistency, and sustainability of actual AI integration.

Theoretical Contribution

This study applied TAM and UTAUT constructs, extended with awareness, self-efficacy, trust, anxiety, and perceived risk, to nursing educators in a North African context, using behavioral intention, the canonical acceptance outcome of both models, as the criterion. The findings offer partial support for these frameworks: intention was strongly predictable (57.4% of variance explained), but the classical determinants were superseded by awareness and self-efficacy. This pattern suggests that in early-stage, low-support adoption contexts, knowledge- and competence-related beliefs may matter more than the cost-benefit evaluations emphasized by TAM, and that the explanatory hierarchy of acceptance models may be context-dependent. The study also addresses an empirical gap by focusing on educators rather than students in Moroccan nursing education, a population and setting where evidence remains scarce despite educators' central role in curriculum innovation and responsible AI integration.

Practical Implications

The findings point to four priorities for educational institutions and policymakers. First, because awareness was the dominant predictor, institutions should invest in structured AI literacy programs covering what AI systems are, their capabilities and limitations, and their ethical, legal, and pedagogical implications in health sciences education. Second, because self-efficacy was an independent predictor, training should be practice-based and interactive (workshops, peer mentoring, and hands-on experimentation with AI tools in authentic teaching situations), so that educators build confidence through mastery experiences. Third, the combination of near-universal informal use and minimal formal training calls for institutional guidelines clarifying acceptable and responsible uses of AI in teaching, assessment, and academic writing. Fourth, the very low perceived facilitating conditions indicate a need for institutional investment in digital infrastructure, access to reliable AI tools, and technical support; although facilitating conditions did not predict intention, adequate support structures are likely to determine whether educators' favorable intentions translate into effective and responsible practice.

Limitations

This study has several limitations. First, its cross-sectional design precludes causal inference; the associations between awareness, self-efficacy, and intention may be bidirectional. Second, the study was conducted in a single institution, which limits the generalizability of the findings to other nursing and health sciences education settings in Morocco or elsewhere; in particular, the low facilitating-condition scores reflect one institutional environment. Third, data were self-reported and may be subject to social desirability and common-method bias. Fourth, behavioral intention, although the canonical acceptance outcome in TAM and UTAUT, is not equivalent to actual sustained use. Fifth, the questionnaire was translated into French by the research team and reviewed by experts, but no formal back-translation was performed. Sixth, although all dimensions showed satisfactory internal consistency, four dimensions had alpha values above 0.95, suggesting possible item redundancy, and full construct validation using exploratory or confirmatory factor analysis was beyond the scope of this study given the sample size. Finally, the modest sample size, while adequate for the regression models estimated, limited the statistical power available for detecting smaller independent effects.

Future Research

Future research should include larger, multi-institution samples to improve generalizability and enable formal psychometric validation of the instrument, including confirmatory factor analysis. Longitudinal designs are needed to examine how awareness, self-efficacy, and intention evolve over time, particularly following training programs or institutional AI implementation strategies, and whether intention translates into sustained, high-quality use. Structural equation modeling in adequately powered samples could clarify the direct and indirect pathways linking awareness, self-efficacy, the classical TAM/UTAUT constructs, and intention, including the possible mediating mechanisms suggested by the present findings. Finally, qualitative studies would provide deeper insight into educators' expectations, concerns, and experiences, and into the ethical, pedagogical, and organizational conditions of responsible AI integration in nursing and health sciences education.

CONCLUSION

This study examined the factors associated with nursing educators' behavioral intention to adopt artificial intelligence (AI) in their teaching practices at the Higher Institute of Nursing Professions and Health Techniques in Laayoune, Morocco. Behavioral intention was high, and almost all educators already used AI tools in their teaching, even though most had received no formal training on AI. In bivariate analyses, younger age, shorter teaching experience, and greater AI knowledge, proficiency, and frequency of use were associated with stronger intention. In the final multivariable model, however, awareness and self-efficacy emerged as the only independent predictors, together explaining more than half of the variance in intention, and they fully accounted for the sociodemographic differences observed. Notably, this favorable intention coexisted with high anxiety, high perceived risk, and very low perceived institutional support, indicating a largely individual, self-directed adoption process.

These findings provide empirical evidence from an underexplored population and geographical context (nursing educators in North Africa) and suggest that in early-stage adoption settings, knowledge- and competence-related beliefs may outweigh the classical determinants emphasized by the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology.

From a practical perspective, the results identify clear and actionable levers. Educational institutions should prioritize structured AI literacy programs to build awareness of AI's capabilities, limitations, and ethical implications; strengthen educators' self-efficacy through practice-based, hands-on training; establish clear institutional guidelines for responsible AI use in teaching and assessment; and invest in the digital infrastructure and support currently perceived as lacking, so that educators' favorable intentions can translate into effective, ethical, and sustainable AI integration. Future research involving multiple institutions, longitudinal designs, and qualitative approaches is recommended to confirm these findings and to examine how intention evolves into sustained practice in nursing and health sciences education.

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AI statement: The authors stated that AI tools assisted with literature review and language refinement, always under strict human supervision.

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