

## Teachers' Awareness of Cultural Biases in Artificial Intelligence: The Role of Digital Literacy and Cultural Competence (Short paper)

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### מודעות מורים להטיות תרבותיות בבינה מלאכותית: תפקיד האוריינות הדיגיטלית והכשירות התרבותית (מאמר קצר)

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#### Abstract

Artificial intelligence (AI) tools are increasingly used for teaching and decision-making, yet they can reproduce cultural, gender, and socioeconomic biases and amplify inequities in schools. This study examined predictors of teachers' awareness of cultural biases in AI, focusing on digital use, technological anxiety, multicultural competence, social proximity, and role-based technological experience. A survey was administered to 120 Israeli K–12 teachers. Awareness of AI bias was measured with an eight-item scale and complemented by one short classroom vignette. Group comparisons and hierarchical regression were conducted. Teachers with extensive technological training reported higher awareness than those with partial or no training, and ICT coordinators reported substantially higher awareness than non-coordinators. Social proximity and digital use were associated with higher awareness; adding the ICT coordinator role explained additional variance and emerged as the strongest. Findings suggest that hands-on digital experience combined with formal school responsibility for technology (e.g., serving as an ICT coordinator) may be key leverage points for developing teachers' bias awareness. Professional development should integrate AI critical literacy with culturally responsive pedagogy and support ICT coordinators as school-level leaders for responsible AI adoption.

**Keywords:** AI bias; teacher awareness; digital literacy; multicultural competence; ICT coordinators.

**מילות מפתח:** הטיות בבינה מלאכותית; מודעות מורים; אוריינות דיגיטלית; כשירות תרבותית; רכז תקשוב.

## Introduction

AI-based systems—including generative AI, recommender systems, and automated assessment—are rapidly entering schools. While these tools promise efficiency and personalization, they also raise equity risks when outputs are treated as neutral or objective.

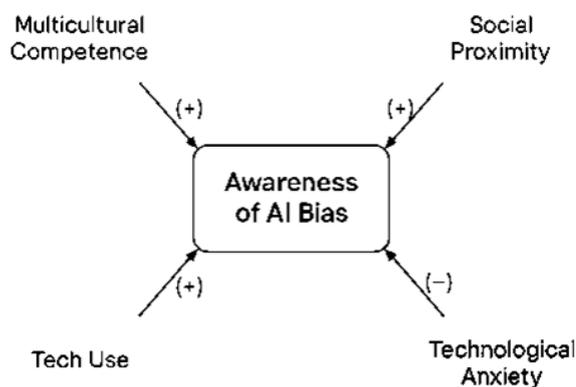
Cultural bias may emerge when training data underrepresent groups, when labels reflect dominant norms, or when model performance differs across populations, leading to stereotypical content, unequal recommendations, and misclassification (Buolamwini & Gebru, 2018; Caliskan et al., 2017; Mehrabi et al., 2021; Noble, 2018). In education, such bias can shape what students see, how they are evaluated, and which opportunities they are encouraged to pursue.

Teachers are key mediators: they choose tools, interpret outputs, and decide whether to trust, question, or override algorithmic suggestions. Prior work indicates that technology-related factors (digital use and anxiety) influence teachers' engagement with educational technologies (Parasuraman & Colby, 2015; Scherer et al., 2019; Teo, 2011), whereas multicultural competence may increase sensitivity to exclusion and inequity (Gay, 2018; Siwatu, 2007). Schools also rely on ICT coordinators as local technology leaders; however, the contribution of this formal role to teachers' awareness of AI bias remains underexplored.

## Theoretical model and hypotheses

Figure 1 presents the theoretical model. We conceptualized awareness of cultural biases in AI as teachers' tendency to recognize biased patterns in AI systems (e.g., stereotypical representations, unequal recommendations) and to critically evaluate outputs. We hypothesized that awareness would increase with (H1) higher intercultural competence and (H2) higher social proximity. We further hypothesized that awareness would be positively related to (H3) digital use and negatively related to (H4) technological anxiety. Finally, we expected role-based technological experience—(H5a) higher technological training and (H5b) serving as an ICT coordinator—to be associated with higher awareness and to explain incremental variance beyond cultural and digital factors.

The model was tested using group comparisons and hierarchical regression.



**Figure 1.** Conceptual model of associations with AI Bias Awareness.

## Method

Participants were 120 Israeli K–12 teachers (81.7% women), aged 22–69 ( $M = 40.16$ ,  $SD = 10.04$ ). Participants completed an online survey distributed through teacher professional networks; participation was voluntary and anonymous.

AI-bias awareness was assessed with eight Likert-type items (1 = strongly disagree, 5 = strongly agree;  $\alpha = .92$ ) tapping recognition of biased outputs and fairness checking (e.g., awareness that AI may reproduce cultural bias or reinforce stereotypes). Digital use (six items; 1 = never, 7 = several times a day;  $\alpha = .84$ ) measured frequency of using digital tools. Technological anxiety (seven items;  $\alpha = .95$ ; one item reverse-coded) assessed discomfort and nervousness when working with technology. Multicultural competence (eight items;  $\alpha = .90$ ) captured readiness to teach in heterogeneous classrooms. Social proximity (six items;  $\alpha = .94$ ) assessed willingness for closeness and interaction with people from different cultural backgrounds; it was coded so that higher scores indicate greater proximity (lower distance). Teachers also reported their level of technological training (none/partial/extensive) and whether they serve as an ICT coordinator (yes/no).

## Results

Analyses included one-way ANOVA comparing training groups (Table 1), an independent-samples t-test comparing ICT coordinators and non-coordinators (Table 2), and hierarchical regression predicting AI-bias awareness (Table 4). Predictors were entered in blocks: cultural-social variables (multicultural competence, social proximity), digital factors (digital use, technological anxiety), and role-based experience variables (training level and ICT coordinator role).

**Table 1.** ANOVA Results for Awareness of AI Biases by Technological Training (N = 120).

Variable	Group	N	M	SD	F	P
Technological Training	Extensive	42	3.26	0.95	F(2,117)=8.63	< .001
	Partial	45	2.70	0.82		
	None	33	2.42	0.92		

$p < .001^{***}$

**Table 2.** t-test Results for Awareness of AI Biases by ICT Coordination. (N=120)

Variable	Group	N	M	SD	T	P
ICT Coordinator	Yes	22	3.83	0.69	t(118)=6.38	< .001
	No	98	2.59	0.85		

$p < .001^{***}$

Descriptively, teachers reported moderate AI-bias awareness ( $M = 2.82$ ,  $SD = 0.95$ ). Awareness differed by technological training,  $F(2, 117) = 8.63$ ,  $p < .001$ : teachers with extensive training scored higher ( $M = 3.26$ ,  $SD = 0.95$ ) than those with partial ( $M = 2.70$ ,  $SD = 0.82$ ) or no training ( $M = 2.42$ ,  $SD = 0.92$ ). ICT coordinators ( $n = 22$ ) reported higher awareness ( $M = 3.83$ ,  $SD = 0.69$ ) than non-coordinators ( $n = 98$ ;  $M = 2.59$ ,  $SD = 0.85$ ),  $t(118) = 6.38$ ,  $p < .001$ ,  $d = 1.51$ . (Table 3)

**Table 3.** Pearson Correlations between Awareness of AI Biases, Digital Literacy, Technological Anxiety, and Cultural Competence (N = 120)

Variables	Mean (St. Div)	1	2	3	4	5
1. AI Bias Awareness	2.82 (0.95)	-				
2. Tech Use (Digital Literacy)	3.70 (1.45)	0.424***				
3. Tech Anxiety	2.01 (1.04)	-0.362***	-0.640***			
4. Multicultural Competence	3.51 (0.83)	0.388***	0.450***	-0.437***		
5. Social Proximity	2.44 (1.09)	0.370***	0.525***	-0.420***	0.510***	

## Discussion and implications

Teachers reported a moderate awareness of cultural bias in AI ( $M = 2.82$ ,  $SD = 0.95$ ), indicating that many acknowledge the risk of biased outputs, but that such awareness is not yet uniformly embedded in routine pedagogical decision-making. Group comparisons revealed clear role- and experience-based differences: teachers with extensive technological training reported higher awareness than those with partial or no training, and ICT coordinators reported substantially higher awareness than non-coordinators. These differences suggest that engagement with educational technologies and implementation responsibility may cultivate a critical stance toward AI outputs in schools.

Correlational patterns reinforced this interpretation. Awareness of AI bias was positively associated with frequency of digital use, intercultural, and social proximity. Technological anxiety, by contrast, was negatively related to both digital use and bias awareness. Together, these links point to a coherent profile: teachers who are digitally active and culturally oriented appear more likely to notice representational gaps, question “neutral” outputs, and intervene when AI reproduces stereotypes.

Implications are practical and immediate. Professional development should integrate AI critical literacy (e.g., cross-checking sources, comparing alternative prompts/outputs, and documenting uncertainty and limitations) with culturally responsive pedagogy, so that “bias awareness” becomes an operational classroom routine rather than an abstract principle. Schools can leverage ICT coordinators as internal facilitators for responsible AI adoption, while also offering scaffolded practice and peer mentoring to reduce technological anxiety. Limitations include self-report measures and cross-sectional design; future work should employ interventions and classroom-based tasks to examine whether training changes not only attitudes but also observable practices of bias detection and mitigation.

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