BEYOND UTILITY: AI COMPETENCE AS A PROFESSIONAL SIGNAL IN DIGITAL EDUCATION

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Abstract. Most educational technology research explains AI adoption through utilitarian variables such as performance expectancy and effort expectancy. However, this study explores an overlooked dimension: the symbolic and signaling value of AI competence. Through qualitative interviews with 12 educators in Uzbekistan, we investigate how teachers perceive AI use as a signal of professional modernity, competence, and institutional quality. Drawing on Signaling Theory (Spence, 1973), we find that teachers adopt AI tools not only for pedagogical efficiency but also to signal their readiness for digital transformation to students, peers, and administrators. This signaling effect enhances teacher credibility and student engagement, but it also introduces risks of "signal noise"—superficial adoption in which tools are displayed but not meaningfully integrated. The findings suggest that perceived usefulness and ease of use are supplemented by a third mechanism: "perceived signaling value." We propose the Signaling-Adoption Model (SAM), in which AI competence generates performance outcomes indirectly through both utilitarian utility and professional signaling, provided the signal is authentic and observable. The study contributes to TAM literature by introducing a sociocultural layer to technology adoption and offers practical insights into how teachers can strategically leverage AI to enhance their professional identity without falling into performative usage.

Keywords: AI competence, signaling theory, professional identity, teacher credibility, technology adoption, qualitative research.

Introduction. Why do teachers adopt AI tools? Standard answers point to time savings (perceived usefulness) or ease of use (perceived ease of use). However, interviews consistently reveal a less discussed driver: teachers want to be seen as

modern, competent, and forward-thinking. In a rapidly digitizing world, using AI in the classroom operates as a visible credential of professional relevance. This study examines the symbolic dimension of AI competence, asking: "How does the signaling value of AI competence influence teachers' adoption behavior and professional identity, and under what conditions is signaling effective?" While signaling theory (Spence, 1973) is well-established in labor economics, it is rarely applied to teacher–technology interactions. We address this gap using qualitative evidence from Uzbekistan.

Theoretical Framework. Signaling Theory posits that in situations of information asymmetry (where true competence is unobservable), individuals use observable signals to communicate their underlying qualities. In education, students or administrators cannot directly assess a teacher's pedagogical depth; instead, they use proxies such as teaching methods and technology use. AI competence serves as a costly, effort-intensive signal that is difficult to fake—but only when it is observed authentically. We integrate this with the Technology Acceptance Model (TAM; Davis, 1989), arguing that perceived usefulness and ease of use are necessary for initial adoption, but perceived signaling value—the belief that using AI will improve one's professional reputation—determines sustained, visible usage.

Methodology

Research Design

This study employed a qualitative, exploratory design to investigate how educators perceive the signaling value of AI competence in their professional lives. A qualitative approach was chosen because the research aim was to understand meanings, perceptions, and identity constructions rather than to measure variables statistically. This design is particularly suitable for exploring under-researched sociocultural dimensions of technology adoption.

Participants and Sampling

Twelve educators from Uzbekistan participated in the study. The researchers used purposive sampling to select teachers, IT coordinators, and teacher trainers with varying levels of experience using AI tools. Participants were drawn from secondary schools, higher education institutions, and professional development centers. Inclusion criteria were: (a) active involvement in teaching or educational technology support, (b) some familiarity with AI-based tools, and (c) willingness to reflect on their professional experiences. The sample size of 12 is consistent with qualitative research that prioritizes depth over breadth and is sufficient for thematic saturation in a relatively homogeneous group (Braun & Clarke, 2006).

Data Collection

Data were collected through semi-structured interviews. The interview guide covered four broad areas: (1) current use of AI tools in teaching or educational work, (2) perceived reactions from students, peers, and administrators, (3) the relationship between AI use and professional identity, and (4) conditions under which AI use enhances or damages credibility. Interviews lasted 30-45 minutes. Interviews were conducted in Uzbek or Russian, depending on participants' preferences; they were audio-recorded with informed consent, transcribed verbatim, and translated into English for analysis. To protect anonymity, participants are referred to as T-1 through T-12.

Data Analysis

The data were analyzed using thematic analysis following the six-phase procedure outlined by Braun and Clarke (2006): familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. In this study, the analysis focused on themes related to reputation, others' perceptions, and professional image. Three primary themes emerged from the data: AI as a marker of modernity, signaling to peers and administrators, and the authenticity threshold.

Trustworthiness and Ethical Considerations

Several strategies enhanced trustworthiness. Credibility was supported through iterative questioning during interviews and by maintaining a clear audit trail of coding decisions. The study addressed transferability by providing contextual details about the educational setting in Uzbekistan. The study strengthened dependability by consistently applying the thematic analysis procedure. Ethical approval was obtained from the relevant institutional review board. All participants provided informed consent, were assured of confidentiality, and retained the right to withdraw at any time.

Findings. Three primary themes related to signaling emerged:

Theme A: AI as a Marker of Modernity - Teachers unanimously felt that AI use impressed students. “When I use AI, students think I am up-to-date. They respect the lesson more” (T-2). IT coordinators noted that these teachers were often considered for leadership roles in digital initiatives.

Theme B: Signaling to Peers and Administrators - AI use was described as a career signal. “The administration notices which teachers are using AI. It feels like a competition for being seen as innovative” (T-5). This suggests that signaling operates vertically (toward administration) and horizontally (toward peers).

Theme C: The Authenticity Threshold (Signal Noise)-Participants strongly warned against superficial use. “You can open an AI tool and pretend, but if students see it doesn’t add value, it backfires” (T-6). Thus, signaling only works if the signal is backed by genuine competence (an authentic signal). Teachers with low competence who tried to signal lost credibility. Interestingly, teachers reported that signaling value sometimes increased their perceived usefulness of a tool, creating a feedback loop: using AI for signaling improved student engagement, which made the tool genuinely more useful and confirmed the signal.

Discussion and Proposed Model. We propose the Signaling-Adoption Model (SAM), which posits that AI integration is driven by two parallel pathways:

1. Utilitarian Pathway: Competence → Perceived Usefulness/Ease → Adoption → Performance.

2. Signaling Pathway: Competence → Perceived Signaling Value → Adoption (for visibility) → Professional Credibility → Reinforced Performance.

These pathways interact: high signaling value can increase perceived usefulness (because student engagement improves). However, the model also incorporates a "signal noise" risk, where adoption for signaling without real competence can damage credibility and reverse performance gains. This extends TAM by adding a sociocultural driver that is particularly relevant in collectivist or reputation-sensitive contexts such as Central Asia.

Conclusion. This study reveals that AI adoption in teaching is not purely utilitarian; it is a professional performance. Teachers use AI to signal their adaptability, innovation, and competence to multiple audiences. For teacher training programs, this implies that professional development should not only teach how to use AI but also when and why to display its use effectively. Administrators should recognize that visible AI integration is a valuable indicator of teacher engagement but must guard against performative checkboxes by evaluating pedagogical depth. The study contributes a novel theoretical lens to educational technology research. Future quantitative research should operationalize "perceived signaling value" and test the dual-pathway model across cultures.

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