RESEARCH ARTICLE

Teacher Readiness for Human-Centred Generative AI Integration in Uzbekistan

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Abstract

Generative artificial intelligence (GenAI) is rapidly changing educational practices, yet the effectiveness of its integration depends less on technological availability than on teachers' pedagogical, ethical, linguistic, and organizational readiness. This study examines teacher readiness for human-centred GenAI integration in English-medium and international-school classrooms in Uzbekistan, where multilingual education, expanding international curricula, and accelerated digital transformation create a distinctive educational context. Drawing on the Technological Pedagogical Content Knowledge framework, technology acceptance research, teacher cognition theory, and recent international AI competency frameworks, the study develops a multidimensional conceptual model of teacher readiness. The proposed model integrates AI literacy, pedagogical readiness, English-medium instructional competence, ethical awareness, perceived usefulness, self-efficacy, institutional support, and human agency. A mixed-methods empirical design is proposed for future validation through teacher surveys and semi-structured interviews. The analytical synthesis indicates that readiness should not be conceptualized as simple willingness to use AI but as the capacity to evaluate, adapt, govern, and pedagogically integrate GenAI while preserving teacher agency and student-centred learning. The study argues that professional development in Uzbekistan should move beyond technical AI training toward context-sensitive, multilingual, ethically grounded, and institutionally supported models of teacher development.

Keywords: generative artificial intelligence; teacher readiness; English-medium instruction; international schools; Uzbekistan; AI literacy; teacher development

1. Introduction

Generative artificial intelligence has rapidly moved from a specialist technological domain into everyday educational practice, creating a profound transformation in the relationship among teachers, learners, knowledge, language, and digital technologies. Unlike earlier educational technologies that generally performed predefined functions, contemporary generative AI systems can produce explanations, lesson plans, assessment materials, examples, translations, feedback, summaries, questions, and other forms of instructional content in response to natural-language prompts. The educational significance of this development therefore extends beyond the adoption of another digital tool. It raises fundamental questions concerning what teachers need to know, how they should exercise professional judgment, how students should interact with machine-generated knowledge, and how educational

institutions should govern the use of systems whose outputs may be inaccurate, biased, culturally inappropriate, or pedagogically unsuitable. UNESCO has consequently emphasized that the integration of generative AI into education should be guided by a human-centred approach that protects human agency, privacy, equity, safety, and meaningful educational participation [1].

These questions are particularly significant in English-medium and international-school contexts. In such classrooms, English frequently functions not only as a subject but also as a medium through which mathematics, science, social sciences, business, technology, and other disciplinary knowledge is taught. Teachers therefore operate simultaneously as subject specialists, language mediators, curriculum interpreters, and facilitators of intercultural communication. The emergence of GenAI introduces another layer into this already complex pedagogical environment. AI systems can generate fluent English explanations, simplify disciplinary texts, translate concepts across languages, produce differentiated learning materials, and provide immediate language feedback. At the same time, their apparent linguistic fluency can conceal factual inaccuracies, culturally inappropriate formulations, stereotypical representations, or language that is formally correct but pedagogically unsuitable for particular learners. Consequently, linguistic fluency in AI output cannot be treated as equivalent to pedagogical quality.

The Uzbek educational context makes this issue especially relevant. Uzbekistan has been undergoing substantial digital transformation in education, with national and international initiatives increasingly emphasizing digital learning, teacher capacity development, and innovative educational technologies. UNICEF reports that Uzbekistan was selected as a Learning Pioneer country and has participated in initiatives designed to identify, co-create, and pilot digital learning solutions, while investments in school connectivity and digital infrastructure have expanded considerably [2]. More recently, teacher-development initiatives in Uzbekistan have explicitly included competencies related to information and communication technologies and artificial intelligence, involving school leaders, STEM teachers, and foreign-language teachers [3]. These developments suggest that the question is no longer whether Uzbek educators will encounter AI-supported education, but rather whether they will possess the professional knowledge and institutional conditions necessary to use it responsibly and effectively.

The international-school and English-medium sector presents a particularly important setting for examining this transition because teachers in these environments may work with international curricula, multilingual student populations, externally developed assessment systems, and pedagogical expectations influenced by international educational standards. The coexistence of English, Uzbek, Russian, and potentially other languages creates opportunities for AI-supported multilingual scaffolding, but it also introduces concerns about linguistic equity and the dominance of English-language AI resources. Teachers may use GenAI to generate bilingual explanations, adapt texts to different proficiency levels, construct vocabulary exercises, or support content-and-language integrated learning. However, such practices require teachers to recognize

when AI-generated linguistic mediation enhances comprehension and when it risks reducing conceptual complexity, reinforcing translation dependence, or marginalizing students' linguistic resources.

The theoretical problem underlying this study is therefore the inadequacy of conceptualizing AI adoption as a binary distinction between users and non-users. Traditional technology-acceptance models emphasize constructs such as perceived usefulness and perceived ease of use [4], while educational technology frameworks demonstrate that effective integration requires the interaction of technological, pedagogical, and content knowledge [5]. In language education, teacher cognition research further shows that what teachers know, believe, and experience influences how they interpret and implement pedagogical innovations [6]. GenAI makes these relationships more complex because teachers must not only know how to operate a system but also understand its limitations, evaluate its outputs, design appropriate pedagogical interactions, and retain responsibility for educational decisions.

Accordingly, this study conceptualizes teacher readiness as a multidimensional construct consisting of technological and AI literacy, pedagogical readiness, content and language awareness, ethical judgment, self-efficacy, perceived usefulness, human agency, and organizational support. The central argument is that teachers should not be considered ready for GenAI merely because they can produce prompts or use chatbot interfaces. Rather, readiness should reflect their ability to determine when AI should be used, why it should be used, how its output should be evaluated, and when human intervention should override or constrain AI-generated recommendations.

The study has three principal objectives. First, it synthesizes theoretical and empirical perspectives relevant to teacher readiness for GenAI integration. Second, it develops a context-sensitive conceptual model applicable to English-medium and international-school classrooms in Uzbekistan. Third, it identifies the organizational, pedagogical, ethical, and professional-development conditions that may facilitate or inhibit meaningful adoption. By connecting TESOL, multilingual education, artificial intelligence, teacher development, ethics, and organizational change, the study seeks to move the discussion from technological enthusiasm or resistance toward a more comprehensive account of professional readiness.

2. Literature Review

Research on educational technology has long demonstrated that successful classroom integration cannot be reduced to technological competence. Shulman's influential concept of pedagogical content knowledge established that effective teaching requires teachers to understand not only subject matter but also how that subject matter can be represented and taught to particular learners [7]. Mishra and Koehler subsequently extended this perspective through the Technological Pedagogical Content Knowledge framework, arguing that technology integration emerges from the interaction among technological knowledge, pedagogical knowledge, and content knowledge rather than from technological knowledge alone [5]. This framework provides an important theoretical foundation for GenAI integration because generative systems do not operate

independently of curriculum and pedagogy. The same AI-generated explanation may be useful in one classroom and inappropriate in another depending on the subject, learner age, language proficiency, curriculum objectives, and assessment context.

Technology acceptance research provides a complementary perspective. Davis's Technology Acceptance Model proposes perceived usefulness and perceived ease of use as central determinants of technology acceptance [4]. Venkatesh et al. later incorporated multiple psychological and organizational variables into the Unified Theory of Acceptance and Use of Technology, emphasizing performance expectancy, effort expectancy, social influence, and facilitating conditions [8]. These models are useful for explaining why teachers may be willing to experiment with GenAI, but they do not fully capture the ethical and pedagogical dimensions of generative systems. A teacher may perceive ChatGPT or another GenAI system as highly useful while simultaneously recognizing that unrestricted use could undermine student autonomy or academic integrity. Thus, acceptance and readiness should not be treated as identical constructs.

Research specifically examining AI in education has highlighted both opportunities and limitations. Zawacki-Richter et al. [9], in a systematic review of artificial intelligence applications in higher education, identified applications involving assessment, prediction, adaptive systems, intelligent tutoring, and profiling, while also noting the relative absence of educator-centred perspectives. This omission is especially important in the GenAI era because teachers are increasingly becoming intermediaries between AI systems and learners. Recent research on ChatGPT and education identifies potential benefits including personalized support, instructional material generation, feedback, brainstorming, and administrative assistance, while simultaneously identifying risks related to inaccurate information, academic integrity, overreliance, privacy, and inadequate teacher preparation [10, 11, 12].

UNESCO's recent AI competency framework represents an important development because it explicitly reconceptualizes teacher competencies in the context of AI [13]. The framework emphasizes that AI changes the teacher-student relationship into a more complex teacher-AI-student relationship and therefore requires teachers to develop new forms of knowledge, skills, and professional judgment. This position is consistent with UNESCO's broader guidance on generative AI, which argues for ethical, safe, equitable, and meaningful use rather than unrestricted technological adoption [1].

Teacher cognition is particularly relevant to language education. Borg [6] demonstrates that language teachers' beliefs, prior experiences, knowledge, and professional identities influence their classroom decisions. GenAI adoption should consequently be examined not only through observable technology use but also through teachers' interpretations of what constitutes legitimate, useful, and pedagogically appropriate AI-mediated learning. In English-medium classrooms, these beliefs may concern the role of English itself, the legitimacy of machine translation, the value of student writing, and the relationship between language proficiency and disciplinary knowledge.

Multilingual education adds another dimension. GenAI can potentially support

translanguaging practices by allowing teachers to compare concepts across languages and provide multilingual explanations. Nevertheless, most major language models have historically demonstrated stronger performance in high-resource languages than in many lower-resource languages. For Uzbek-medium or Uzbek-supported learning environments, teachers may therefore need particularly strong critical evaluation skills. The linguistic fluency of an AI-generated response should not be interpreted as evidence that its Uzbek terminology, cultural references, or pedagogical adaptation is accurate.

The literature consequently reveals a significant research gap. Existing studies have examined AI acceptance, AI literacy, student perceptions, academic integrity, and general teacher attitudes, but relatively little research has examined the intersection of GenAI readiness, English-medium instruction, multilingualism, teacher agency, and organizational support in Uzbekistan. The present study addresses this gap by proposing that teacher readiness is multidimensional and context dependent rather than reducible to technology acceptance.

3. Methods

The study adopts a mixed-methods, sequential explanatory design intended for empirical investigation of teacher readiness for human-centred GenAI integration in English-medium and international-school classrooms in Uzbekistan. The methodological framework combines quantitative measurement of teacher readiness with qualitative exploration of teachers' experiences, perceptions, concerns, and institutional contexts. This approach is appropriate because readiness includes both measurable dimensions, such as self-efficacy and perceived usefulness, and contextualized professional judgments that may not be adequately captured through closed-ended survey items.

The quantitative component is designed around a multidimensional Teacher GenAI Readiness construct. The proposed instrument consists of theoretically derived dimensions representing AI literacy, pedagogical readiness, English-medium instructional readiness, ethical awareness, perceived usefulness, self-efficacy, human agency, and institutional support. Items would be measured using a five-point Likert scale ranging from strong disagreement to strong agreement. The instrument would first be reviewed by experts in TESOL, educational technology, AI, and teacher education to establish content validity. A pilot study would then be conducted with a small group of teachers to assess item clarity and preliminary reliability.

For the full study, the target population would consist of teachers working in English-medium, bilingual, and international-school settings in Uzbekistan. Sampling should intentionally include variation in teaching experience, subject specialization, school type, international curriculum exposure, and previous AI experience. Such variation is essential because technology readiness may differ substantially between an experienced international-school teacher with extensive digital experience and a teacher who has only recently encountered generative AI.

Quantitative analysis would include descriptive statistics, reliability analysis, exploratory factor analysis where appropriate, and confirmatory factor analysis for validation of the multidimensional structure. Structural

equation modelling could subsequently be used to examine relationships among perceived usefulness, AI self-efficacy, ethical awareness, institutional support, and intended pedagogical integration. The proposed theoretical model assumes that institutional support and AI self-efficacy may influence perceived usefulness and that these variables may subsequently influence meaningful integration. Importantly, ethical awareness and human agency are treated not as obstacles to adoption but as constitutive dimensions of responsible readiness.

The qualitative component would involve semi-structured interviews with a purposively selected subset of participants. Interview questions would explore teachers' experiences with GenAI, examples of classroom use, perceived benefits, concerns regarding accuracy and student dependence, multilingual applications, professional-development needs, and school-level policies. Thematic analysis would then be used to identify recurring patterns and contextual explanations for quantitative relationships.

Ethical procedures should include informed consent, voluntary participation, anonymization, secure data storage, and explicit separation of research participation from employment evaluation. Since teachers may discuss institutional policies or classroom practices, confidentiality is particularly important. No individual teacher or school should be identifiable in the final dataset unless explicit permission is obtained. The research design therefore treats teachers not as passive recipients of AI policy but as professional agents whose experiences should contribute to institutional decision-making.

4. Results and Analysis

Because the present manuscript is being developed without an original survey dataset, the Results section does not report invented participant statistics. Instead, it presents the analytical results of the conceptual synthesis and identifies the dimensions that should constitute the empirical Teacher GenAI Readiness model. This distinction is methodologically important because presenting hypothetical values as observed findings would compromise the scientific validity of the manuscript. The analytical evidence nevertheless permits several theoretically grounded conclusions concerning the structure of teacher readiness in the Uzbek English-medium and international-school context.

The first major finding is that teacher readiness is multidimensional. The literature indicates that technical familiarity alone cannot adequately predict effective classroom integration. A teacher may know how to formulate prompts and obtain AI-generated materials while lacking the pedagogical knowledge necessary to determine whether those materials support curriculum objectives. Similarly, a teacher may have high confidence in AI but insufficient awareness of hallucination, bias, privacy, or intellectual-property risks. The proposed model therefore distinguishes between operational AI competence and professional AI readiness.

The second finding concerns the centrality of pedagogical judgment. GenAI can produce lesson plans, reading passages, discussion questions, rubrics, vocabulary activities, and differentiated explanations with considerable speed. However, the production of material is not equivalent to effective teaching. Teachers must determine whether generated material is aligned with learning outcomes, whether its

cognitive demands are appropriate, whether it reflects the curriculum, and whether it promotes active learning rather than cognitive outsourcing. Recent international guidance similarly emphasizes that AI should be deployed with pedagogical purpose rather than treated as an automatic substitute for teacher expertise [1, 13].

The third analytical finding is that English-medium instruction creates both opportunities and additional risks. AI can support teachers by generating simplified English explanations, multilingual glossaries, alternative examples, and differentiated texts. Such capabilities may be particularly valuable in classrooms containing learners with heterogeneous English proficiency. Nevertheless, the teacher must remain responsible for ensuring that simplification does not distort disciplinary meaning and that translation does not eliminate opportunities for meaningful language development. This suggests that English-medium AI readiness should include both language-pedagogical knowledge and critical evaluation of AI-generated language.

The fourth finding concerns institutional support. Technology acceptance research indicates that facilitating conditions influence actual technology use [8], while Uzbekistan's recent digital-education initiatives demonstrate increasing attention to institutional capacity and teacher development [2, 3]. A teacher who possesses individual AI competence may nevertheless avoid classroom integration if school policy is unclear, professional-development opportunities are limited, infrastructure is inadequate, or administrators evaluate AI use primarily through risk avoidance. Conversely, institutional environments that provide training, experimentation, peer collaboration, and clear ethical guidelines can convert individual interest into sustainable practice.

The proposed analytical dimensions are summarized in Table 1.

Table 1. Dimensions of Teacher Readiness for Human-Centred GenAI Integration

Dimension	Core meaning	Relevance to English-medium and international schools
AI literacy	Understanding capabilities, limitations, and basic mechanisms of GenAI	Enables teachers to evaluate rather than blindly trust AI-generated content
Pedagogical readiness	Ability to integrate AI with learning objectives and teaching strategies	Prevents technology from becoming an end in itself
English-medium readiness	Ability to evaluate AI-generated English and multilingual materials	Supports content-and-language integrated learning
Ethical awareness	Understanding privacy, bias, academic integrity, and responsible use	Protects students and maintains professional standards
AI self-efficacy	Confidence in using and evaluating GenAI	Influences experimentation and sustained use

Perceived usefulness	Belief that AI improves teaching effectiveness or efficiency	Influences acceptance and adoption
Human agency	Capacity to retain professional judgment and responsibility	Prevents teacher displacement and uncritical automation
Institutional support	Training, policy, infrastructure, leadership, and peer support	Converts individual competence into sustainable organizational practice

The model suggests that these dimensions should not be interpreted as independent variables existing in isolation. Rather, they form an interconnected readiness system. For example, AI self-efficacy may increase experimentation, but experimentation without ethical awareness may produce inappropriate classroom practices. Similarly, strong institutional support may facilitate access to AI, but access without pedagogical readiness may result in superficial adoption.

The second analytical result concerns the relationship between perceived usefulness and meaningful integration. Existing technology-acceptance literature predicts that teachers are more likely to adopt technologies when they perceive clear instructional or professional benefits [4, 8]. In the case of GenAI, these benefits may include reducing routine preparation time, generating differentiated materials, supporting multilingual explanation, and assisting with formative feedback. However, the present conceptual analysis suggests that usefulness should be defined pedagogically rather than administratively. A tool that saves ten minutes of preparation but encourages low-quality learning may not constitute meaningful educational improvement.

The third major result concerns human-centredness. UNESCO's guidance positions human agency as a central principle of AI integration [1, 13]. In the classroom, this means that teachers remain responsible for decisions concerning curriculum, assessment, student wellbeing, interpretation of AI output, and the distribution of cognitive responsibility between humans and machines. The teacher should therefore function not merely as an AI operator but as an evaluator, designer, mediator, and ethical decision-maker.

Table 2 presents the expected relationships that should be empirically tested in the proposed study.

Table 2. Proposed Relationships in the Teacher GenAI Readiness Model

Relationship	**Expected direction**	**Theoretical rationale**
AI literacy → AI self-efficacy	Positive	Knowledge of AI capabilities can reduce uncertainty
AI self-efficacy → GenAI integration	Positive	Confidence facilitates experimentation and continued use
Perceived usefulness → GenAI integration	Positive	Consistent with technology-acceptance theory

Institutional support → GenAI integration	Positive	Training and facilitating conditions enable implementation
Ethical awareness → Human-centred integration	Positive	Ethical judgment constrains inappropriate automation
Pedagogical readiness → Meaningful integration	Positive	Technology must be aligned with learning objectives
English-medium readiness → Multilingual AI integration	Positive	Language awareness supports appropriate AI-mediated scaffolding
Human agency → Responsible integration	Positive	Professional judgment prevents uncritical dependence

Taken together, the analytical results indicate that the most appropriate outcome variable is not simply "AI use" but **meaningful and responsible GenAI integration**. Frequency of use may be an inadequate indicator because frequent use can represent either sophisticated pedagogical integration or uncritical dependence. A teacher who uses AI only twice a month to develop carefully evaluated differentiated materials may demonstrate greater readiness than a teacher who uses AI daily but delegates lesson planning, assessment, and feedback without sufficient verification.

This distinction has substantial implications for empirical measurement. A future survey should therefore include behavioral indicators alongside attitudinal measures. Teachers should be asked not only whether they use GenAI but also for what purposes, how frequently they verify outputs, whether students are informed about AI use, whether AI-generated materials are adapted, and how teachers decide when AI should not be used. Such indicators would enable researchers to distinguish technological adoption from pedagogically responsible adoption.

5. Discussion

The findings of the conceptual analysis support a shift from technology-centred to teacher-centred understandings of GenAI integration. Much of the public discourse surrounding generative AI in education has focused on whether teachers and students should use systems such as ChatGPT, Gemini, or comparable tools. Such framing is insufficient because it treats adoption as the central educational outcome. The more important question is whether teachers possess the professional capacity to decide how, when, and why generative AI should participate in learning. This distinction is consistent with UNESCO's human-centred framework, which emphasizes ethical, safe, equitable, and meaningful integration [1].

The proposed multidimensional readiness model also extends conventional technology-acceptance approaches. Perceived usefulness and perceived ease of use remain important because teachers are unlikely to adopt systems they perceive as inaccessible or pedagogically irrelevant [4]. However, these constructs cannot explain the full complexity of GenAI adoption. Teachers may perceive an AI system as extremely useful and simultaneously judge that its unrestricted use would undermine student learning. Consequently, ethical awareness, human agency, and pedagogical readiness should be incorporated into

models of AI acceptance rather than treated as secondary concerns.

The English-medium context is particularly important because language itself becomes part of the AI-mediated pedagogical process. In a conventional classroom, the teacher controls linguistic input and can immediately adapt explanations to student comprehension. With GenAI, some of this linguistic mediation can be delegated to a computational system. This creates opportunities for differentiated instruction but also introduces new forms of uncertainty. AI-generated English may appear polished while being conceptually inaccurate or inappropriate for learners at particular proficiency levels. Moreover, multilingual learners may receive highly fluent English responses that inadvertently discourage the strategic use of Uzbek or other languages as cognitive resources. Teachers therefore need to exercise linguistic as well as technological judgment.

The Uzbek context further reinforces the importance of institutional change. Recent initiatives demonstrate that the country's education system is actively investing in digital transformation and teacher capacity. UNICEF's work with education authorities has included digital-school development, leadership workshops, and teacher training involving ICT and AI competencies [2, 3]. These developments create a favorable foundation for AI integration, but infrastructure and training alone cannot guarantee meaningful adoption. Professional learning needs to address classroom scenarios, subject-specific applications, multilingual pedagogy, AI evaluation, academic integrity, privacy, and the redesign of assessment practices.

Teacher development should consequently move beyond short workshops explaining how to write effective prompts. Prompting is only one component of AI literacy. A professionally prepared teacher must also be able to identify fabricated information, recognize inappropriate simplification, detect cultural bias, compare outputs across languages, protect student information, and determine whether a learning activity should involve AI at all. In this sense, AI literacy becomes a form of professional judgment rather than merely a technical skill.

The findings also support a conception of organizational change in which teachers participate in policy development. School-level AI policies developed without teacher involvement may become either excessively restrictive or insufficiently protective. Teachers possess practical knowledge about classroom realities, student behavior, curriculum constraints, and assessment requirements. Their involvement can therefore help institutions develop policies that distinguish legitimate pedagogical use from problematic forms of dependency or academic misconduct.

Another important implication concerns international schools. Because these schools often operate through internationally oriented curricula and multilingual communities, they may become early adopters of educational AI. Their experiences could therefore provide valuable models for broader educational reform in Uzbekistan. However, early adoption should not be equated with educational leadership. International schools should demonstrate not only technological sophistication but also responsible governance, teacher agency,

linguistic inclusion, and evidence-based evaluation.

The proposed model also contributes to TESOL research. GenAI is increasingly capable of producing language-learning materials, conversational practice, explanations, writing feedback, and translations. Yet the teacher's role remains essential because language learning involves social interaction, identity, motivation, pragmatic competence, and contextual meaning. AI can generate language, but teachers must design environments in which learners use language purposefully and critically. Human-centred GenAI integration should therefore strengthen rather than displace communicative and learner-centred pedagogy.

6. Conclusion

Generative artificial intelligence is likely to become an increasingly significant component of educational practice in Uzbekistan, particularly in English-medium and international-school environments where digital technologies, international curricula, and multilingual communication intersect. The central challenge, however, is not simply technological adoption. The more fundamental challenge is developing teachers who can use GenAI critically, pedagogically, ethically, and strategically while maintaining responsibility for educational decisions. This study has therefore proposed a multidimensional understanding of teacher readiness that incorporates AI literacy, pedagogical readiness, English-medium instructional competence, ethical awareness, self-efficacy, perceived usefulness, human agency, and institutional support.

The analysis demonstrates that teacher readiness should not be operationalized through frequency of AI use alone. Frequent use does not necessarily indicate effective integration, just as limited use does not necessarily indicate low competence. What matters is the quality and purpose of the interaction between teacher, learner, curriculum, and AI system. A teacher who critically evaluates AI-generated materials, adapts them to learners, verifies factual claims, considers multilingual implications, and protects student agency demonstrates a substantially more sophisticated form of readiness than a teacher who simply delegates routine instructional decisions to an AI system.

For Uzbekistan, this distinction is particularly important because national and international initiatives are already strengthening digital infrastructure and teacher competencies. The recent expansion of digital-school initiatives and AI-related teacher development indicates that the institutional conditions for further development are emerging [2, 3]. The next stage should therefore focus on the quality of professional learning rather than technology acquisition alone. Teacher-development programmes should incorporate practical classroom applications, AI evaluation, multilingual pedagogy, ethics, privacy, assessment redesign, and reflective professional practice.

The study further argues that English-medium and international schools can serve as strategically important environments for examining responsible AI integration. These schools operate at the intersection of international curricula, English-medium instruction, multilingual learners, and rapidly changing educational technologies. Research in these settings can therefore contribute not only to Uzbek

educational policy but also to wider international discussions concerning AI, language education, and teacher professionalism.

From a theoretical perspective, the proposed framework extends technology-acceptance models by integrating pedagogical and ethical dimensions and develops the implications of TPACK for generative AI. It also incorporates insights from teacher cognition research by recognizing that beliefs, professional identity, experience, and institutional context influence how teachers interpret AI. Most importantly, it positions human agency as a constitutive component of readiness rather than an optional ethical supplement.

Future empirical research should validate the proposed framework using a sufficiently diverse sample of teachers from English-medium, bilingual, and international schools across Uzbekistan. Quantitative analysis should test the reliability and factorial structure of the proposed readiness dimensions, while structural modelling could examine relationships among self-efficacy, institutional support, perceived usefulness, ethical awareness, and actual integration. Qualitative interviews should complement these findings by examining how teachers negotiate uncertainty, multilingualism, professional identity, and institutional expectations. Such research would provide the empirical foundation necessary for developing a context-sensitive Teacher GenAI Readiness Index for Uzbekistan.

Ultimately, human-centred GenAI integration should not be understood as a process through which teachers gradually transfer their professional responsibilities to machines. It should instead be understood as a process through which teachers acquire new forms of professional expertise and use computational systems selectively to expand their pedagogical possibilities. In this model, AI contributes speed, generative capacity, and adaptive possibilities, whereas teachers retain responsibility for judgment, relationships, curriculum, ethics, language, and educational purpose. For Uzbekistan's emerging English-medium and international-school sector, this balance between technological capability and human professional agency may determine whether GenAI becomes merely another digital tool or develops into a meaningful component of educational transformation.

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