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Whose Knowledge Counts? Cultural Facilitation and the Adoption of Artificial Intelligence in Burundian Secondary Education

Prudence Ndungutse-Mubiri*, Fouad Yehya
BSc (Medical Bioscience), PGCE, MA (Educational Leadership), MBA (International Relations and Diplomacy), PhD (AI and Cybersecurity in Education)

Abstract- Technology-acceptance research has been criticized for treating culture as a secondary moderator rather than a precondition of adoption, a critique with particular force in collectivist, multilingual educational settings. This study examined how cultural and contextual factors shape the adoption of Artificial Intelligence (AI) at Discovery School, a secondary school in Bujumbura, Burundi. A convergent mixed-methods design combined a structured survey (n = 110: administrators, teachers, students, parents) with semi-structured interviews (n = 35), analyzed in SPSS 27 (descriptive statistics, one-way ANOVA) and NVivo 14 (six-phase thematic analysis, Cohen's $\kappa = 0.83$), and triangulated using a joint-display approach. Cultural acceptance of AI appeared moderate and relatively neutral in the survey data ($M = 3.72$, $SD = 0.63$), and one-way ANOVA revealed a statistically significant difference across stakeholder groups, $F(3,103) = 4.16$, $p = .008$, $\eta^2 = 0.108$, with administrators and teachers rating AI's cultural fit significantly higher than parents. Qualitative analysis, however, identified Cultural and Institutional Readiness/Management as the single most prominent theme in the entire dataset (44.7% of 171 coded references, 28 interviewees) — far exceeding the theme of AI's pedagogical benefit itself — revealing that parents' comparatively lower ratings reflect a principled negotiation of teachers' moral authority and cultural legitimacy rather than rejection of AI as such. Triangulation identified this contrast between quantitative neutrality and qualitative tension as the most important finding of the study: a five-point survey scale substantially understated the depth of cultural negotiation that interviews revealed. The study proposes a cultural facilitation precondition, extending the Technology Acceptance Model to treat community trust and cultural legitimacy as antecedents of, rather than secondary moderators of, perceived usefulness and ease of use in collectivist educational settings, and offers implications for culturally responsive AI adoption and community engagement in Burundi and comparable African contexts.

Keywords: Culture; Technology Acceptance Model; Artificial Intelligence in Education; Teacher Authority; Collectivism; Sub-Saharan Africa; Burundi; Mixed Methods

I. Introduction

Educational technology research has consistently shown that the success of an innovation depends on more than its technical design: cultural beliefs, community trust, and the social position of teachers all shape whether a technology is accepted, tolerated, or resisted (Tabulawa, 2013; Selwyn, 2021). This is especially consequential for Artificial Intelligence (AI) in African education, where most available evidence is generated in, and reflects the assumptions of, high-income Western contexts (Williamson and Eynon, 2020; Gbadebo, 2024). Burundi's education system is shaped by a collectivist culture in which education carries strong communal and moral significance, instruction spans Kirundi, French, and English, and the teacher occupies a position of social and moral authority that is not simply a professional role (Tabulawa, 2013; Rwantabagu, 2014).

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Discovery School, a private secondary school in Bujumbura, has adopted AI-based adaptive learning tools within this cultural context. This study asked how cultural and contextual factors influence the integration of AI and personalized learning at Discovery School, and what this understanding implies for future policy and implementation. The question matters because technology-acceptance frameworks built on individualist assumptions may misrepresent adoption dynamics in collectivist settings, understating the role of community trust and overstating the explanatory power of individual perception alone (Selwyn, 2021; Van de Vijver and Leung, 2021); a possibility this study tests directly by triangulating quantitative survey data against qualitative interview data specifically on this dimension.

II. Theoretical Framework and Related Literature

The Technology Acceptance Model (TAM) explains adoption through perceived usefulness and perceived ease of use (Davis, 1989), and its extensions: UTAUT (Venkatesh et al., 2012) and TAM3 (Venkatesh and Bala, 2008) introduce social influence and facilitating conditions as factors that moderate the strength of these perceptions. Critical education-technology scholarship, however, argues that TAM's individualistic focus under-attends to the structural, institutional, and cultural factors that shape perception in the first place (Selwyn, 2021; Gbadebo, 2024): school-leadership endorsement, reliable electricity, curriculum compatibility, and, crucially, cultural legitimacy in the eyes of parents and community leaders, are treated by classical TAM as external to the model rather than as its precondition. Constructivist Learning Theory (CLT) is likewise subject to a specifically cultural critique: Tabulawa (2013) argues that in Sub-Saharan Africa, teacher-centered pedagogy reflects the social and moral authority of teachers and their responsibility for knowledge transfer, rather than a merely inferior alternative to learner-centered discovery approaches, so that AI tools introduced without regard to this authority risk generating silent resistance rather than genuine engagement (Nsyengula et al., 2025; Ouyang and Jiao, 2021). Self-Determination Theory (SDT) contributes the construct of relatedness, the need to feel socially connected, which in a collectivist society is bound up with community and family approval of a technology, not merely with peer interaction inside the classroom (Ryan and Deci, 2000).

This study's specific contribution is to test empirically whether cultural facilitation operates as TAM's existing extensions suggest, as a moderating factor that strengthens or weakens an already-forming perception of usefulness, or, as critical scholarship suggests, as a precondition that must be established before such perceptions can meaningfully form at all (Halton, 2019; Van de Vijver and Leung, 2021).

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III. Materials and Methods

This study forms part of a broader convergent mixed-methods case study of AI adoption at Discovery School (embedded case study design; Yin, 2018), reported here for the cultural dimension specifically. Quantitative data were collected through a structured survey administered to 110 purposively sampled respondents, stratified by stakeholder role (5 administrators, 20 teachers, 70 students, 15 parents), including a Cultural Considerations subscale (Cronbach's $\alpha = 0.79$). Qualitative data comprised 35 semi-structured interviews conducted in English, French, or Kirundi according to participant preference and analyzed using Braun and Clarke's (2008) six-phase thematic framework in NVivo 14, with 20% of transcripts independently double-coded (Cohen's $\kappa = 0.83$). For the cultural dimension specifically, quantitative analysis comprised descriptive statistics for the Cultural Considerations construct and one-way ANOVA with Tukey HSD post-hoc tests examining differences in perceived AI effectiveness across the four stakeholder groups, as a proxy for differential cultural acceptance. Qualitative analysis focused on the theme Cultural and Institutional Readiness/Management. Findings from both strands were triangulated using the convergence–complementarity–divergence framework of Fetters, Curry, and Creswell (2013). Ethical clearance and Discovery School's written permission were obtained prior to data collection.

IV. Results

1. Quantitative Cultural Acceptance

Cultural Considerations were rated moderately overall ($M = 3.72$, $SD = 0.63$), a figure that, read alone, suggests a broadly neutral cultural climate around AI adoption. One-way ANOVA of perceived AI effectiveness by stakeholder role revealed a statistically significant difference, $F(3,103) = 4.16$, $p = .008$, $\eta^2 = 0.108$, indicating that stakeholder role explains approximately 10.8% of the variance in perceived effectiveness. Tukey HSD post-hoc comparisons showed that administrators ($M = 4.29$) and teachers ($M = 4.08$) rated AI significantly higher than parents ($M = 3.47$) ($p = .004$ and $p = .038$, respectively); teachers and students ($M = 4.09$) did not differ significantly. This pattern is consistent with two distinct evaluative frameworks: teachers and administrators judge AI primarily on functional, pedagogical usefulness, whereas parents judge it on trustworthiness, safety, and long-term impact on their children (Livingstone and Blum-Ross, 2020). Table 1 below summarizes these results:

Table 1. One-way ANOVA: perceived AI effectiveness by stakeholder role.

Source	SS	df	MS	F	p	η^2
Between groups	9.302	3	3.101	4.16	.008	0.108
Within groups	76.834	103	0.746	—	—	—
Total	86.136	106	—	—	—	—

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2. Qualitative Evidence: Cultural and Institutional Readiness

Thematic analysis identified Cultural and Institutional Readiness/Management as the single most prominent theme in the entire dataset (44.7% of 171 coded references, 28 interviewees), substantially exceeding AI for Personalized Learning (28.5%), the theme most directly concerned with pedagogical benefit. Teachers described parental doubt as rooted in a perceived threat to teacher authority: "When parents think of AI as something that takes away from the teacher, they resist. We need to engage and talk with them" (Teacher T9). Parents articulated this concern directly, in French: "Nous voulons que l'école tienne compte de nos traditions; l'outil doit aider, pas remplacer" ("We want the school to take into account our traditions; the tool should help, not replace") (Parent P2), a statement expressing not blanket rejection of AI, but an insistence on the priority of human, teacher-led education within Burundian educational culture. Administrators, in turn, framed cultural acceptance as an institutional governance responsibility: "Commitment to policy, budget and teacher development is necessary from the leadership for the success of AI" (Administrator A3). A striking silence emerged across all interviews: no participant questioned whether AI tools designed abroad, and delivered primarily in English or French, were culturally or linguistically appropriate for Kirundi-speaking Burundian children, nor was the choice of specific AI platforms itself ever questioned, a silence that itself indicates limited critical engagement with the origins and design assumptions of the technology in use.

3. Triangulation: A Quantitative–Qualitative Divergence

Triangulating the two strands for the cultural dimension revealed the study's most important single finding: a clear divergence between quantitative neutrality and qualitative tension. The survey data (M = 3.72) suggested cultural acceptance of AI was a settled, moderately positive matter; the interview data showed cultural negotiation to be the dominant, most actively discussed concern among all stakeholders. This divergence does not indicate that either method produced an incorrect result; rather, it demonstrates that a five-point Likert scale cannot capture the depth of an ongoing negotiation over authority, trust, and legitimacy that open-ended interviews were able to surface. Relying on the survey data alone would have supported the conclusion that culture is a minor, largely resolved contextual factor in AI adoption at Discovery School; the qualitative data show this conclusion to be substantially incomplete.

V. Discussion

These findings support extending TAM specifically for collectivist, multilingual educational contexts. Rather than treating cultural and social factors as moderators that adjust the strength of an already-forming perception of usefulness, as in TAM3 and UTAUT (Venkatesh and Bala, 2008; Venkatesh et al., 2012), the evidence from Discovery School indicates that community trust and cultural legitimacy function as a precondition: without them, perceived usefulness and ease of use cannot be assumed to form in the way classical TAM predicts. This study terms this a cultural facilitation precondition. The finding is best evidenced by the ANOVA result itself: parents' significantly lower ratings of AI's effectiveness are not explained by lower technical exposure or understanding, but by a values-based evaluation of trust, safety, and the preservation of teachers' moral role, as the qualitative data make explicit.

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The quantitative–qualitative divergence itself carries a distinct methodological implication: in cultural research on technology adoption in collectivist societies, quantitative attitude scales risk systematically understating the depth and specificity of cultural negotiation, simply because they are not designed to surface it. Mixed-methods designs that pair such scales with open-ended interviews are therefore not merely methodologically thorough but substantively necessary for accurately characterizing cultural dynamics in this kind of setting. This also refines CLT's application in Burundi: teacher-centered authority, which Tabulawa (2013) identifies as a living cultural practice rather than a colonial residue, is precisely what parents in this study sought to protect, and any AI implementation that appears to bypass or diminish it risks generating the silent resistance Tabulawa describes, even where survey-measured attitudes appear moderately positive.

VI. Practical and Policy Implications

For school leaders, the central implication is that parental and community concern should be treated as a resource for dialogue, not an obstacle to be managed through one-way reassurance. Establishing a genuine, two-way communication channel, explaining specifically how AI supports rather than supplants teachers, and how student data are protected, is likely to do more to build sustainable acceptance than any purely technical improvement to the tools themselves.

Framing AI explicitly as a tool that assists teachers, echoing parents' own language, is a low-cost, evidence-aligned communication strategy. For policymakers and platform developers, the near-total silence around linguistic and cultural fit is an urgent signal rather than a neutral absence: multilingual interfaces in Kirundi, French, and English should be treated as a baseline requirement for AI platforms used in Burundian schools, not an optional localization feature, and community consultation, involving parents, community leaders, and teachers in reviewing platform choice, should precede rather than follow adoption decisions.

Limitations and Future Research

The cultural findings are drawn from a single, urban, comparatively well-resourced private school and cannot be assumed to generalize to rural Burundian communities, where cultural dynamics around technology and authority may differ. The cross-sectional design captures cultural attitudes at a single point in time and cannot show whether the tension identified here resolves, intensifies, or remains stable as AI use matures. Priority directions for future research include a rural–urban comparative study to test whether the cultural dynamics identified here are specific to Discovery School's urban, private context; a regional East African comparison (Kenya, Rwanda, Tanzania, Uganda) to determine whether Burundi's cultural negotiation pattern is distinctive or shared; and dedicated linguistic-accessibility research testing whether Kirundi-language AI interfaces change parental and student engagement with these tools.

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VII. Conclusion

Culture is not a peripheral moderating factor in AI adoption at Discovery School; it is the dominant concern in stakeholders' own accounts of the technology, even where survey data suggest a moderate, settled acceptance. Parental concern reflects a principled negotiation of teacher authority and cultural legitimacy, not rejection of AI, and this negotiation is best supported by treating community trust as a precondition for technology acceptance rather than a secondary factor to be managed after adoption decisions are made. The proposed cultural facilitation precondition extends the Technology Acceptance Model for collectivist, multilingual educational contexts, and the quantitative–qualitative divergence identified here underscores the necessity of mixed-methods research for accurately characterizing cultural dynamics in African AI-in-education adoption.

Declarations

- Funding. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. Conflict of Interest. The authors declare no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
- Ethical Approval. The study received institutional ethical clearance prior to data collection, together with formal written permission from Discovery School's leadership. Informed consent was obtained from all adult participants; parental/guardian consent and student assent were obtained for minor participants.
- Data Availability Statement. The datasets generated and analyzed during this study are available from the corresponding author on reasonable request, subject to the confidentiality undertakings given to participants and Discovery School.
- CRediT Authorship Contribution Statement. Dr. Prudence Ndungutse-Mubiri: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing. Dr. Fouad Yehya: Supervision, Methodology, Writing – review & editing.
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