THE PHENOMENON OF STRATEGIC CATALYSTS AND BARRIERS IN EDUCATION TECHNOLOGY ENTREPRENEURSHIP: A MULTI-CASE STUDY AND COMPARATIVE ANALYSIS

Wasib Bin Latif [*], Mohammad Bin Amin [**], Gouranga Chandra Debnath [***], Rubab Salehin [****], Md. Abdullah Al Mamun [*****]

[*] American East Coast University, New York, USA
[**] Department of Business Administration, Faculty of Business Studies, Bangladesh Army University of Science and Technology, Saidpur, Bangladesh
[***] School of Business & Economics, United International University, Dhaka, Bangladesh
[****] School of Business, University of Liberal Arts Bangladesh, Dhaka, Bangladesh
[*****] *Corresponding author,* Doctoral School of Regional Sciences and Business Administration, Kautz Gyula Faculty of Business and Economics, Széchenyi István University, Győr, Hungary
Contact details: Doctoral School of Regional Sciences and Business Administration, Kautz Gyula Faculty of Business and Economics, Széchenyi István University, Egyetem ter 1, Győr 9026, Hungary

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Abstract

Educational technology (EduTech) entrepreneurship in Bangladesh is expanding rapidly, yet growth remains uneven across income and urban-rural divides. Using an exploratory multi-case qualitative design, we compare three leading ventures (10 Minute School, Shikho, and Bohubrihi) through 27 semi-structured interviews and four focus groups, analyzed via reflexive thematic analysis with a hybrid codebook, constant comparison, and an audit trail. Two catalysts consistently supported scale: localized, curriculum-aligned content and cloud/artificial intelligence (AI)-enabled delivery that can lower cost-to-serve and guide learning progression. Two barriers constrained inclusive growth: device/data affordability tied to rural connectivity gaps, and governance/finance frictions that slow partnerships, approvals, and investment pipelines. A comparative lens from Malaysia suggests that coordinated policy rails, teacher professional-development pathways, and programmatic/blended finance can crowd in private capital and accelerate school integration. The study contributes to debates on governance and innovation in the education industry by showing why regulation and data governance shape whether digital learning systems translate into equitable outcomes (Xhafaj et al., 2022; Tridalestari & Prasetyo, 2024).

Keywords: EduTech Entrepreneurship, Strategic Catalysts, Barriers to Scale, Digital Inclusion, Cloud- and AI-Enabled Learning, Policy and Blended Finance

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1. INTRODUCTION

The world is becoming globalized in terms of educational technology (EduTech), but in developing markets, the outcome tends to rely on the policy, infrastructure, and sociocultural background of that particular country. A case in point is Bangladesh, the young, digitally rapidly moving, yet institutionally imbalanced country. Though there have been growths in access, due to government projects in information and communication technology (ICT) and mobile-first operations, the adoption is not even among urban-rural and income lines (Salimi, 2024). The paper discusses the EduTech entrepreneurship ecosystem in Bangladesh to respond to one key question:

RQ1: Which strategic, technological, market, and policy variables have the strongest facilitating or constraining effects on equitable and scalable growth?

By locating the research question in the existing bodies of entrepreneurial ecosystem and digital inclusion literature, we employ several examples to shed light on how catalysts (e.g., smartphone penetration, cloud delivery, localized curricula, and supportive rhetoric) and barriers (e.g., digital literacy gaps, affordability issues, regulatory frictions, and thin risk capital) interrelate. The impact is two-fold: 1) a synthesized, situation-specific map of ecosystem dynamics in a lower-middle-income environment; and 2) practical implications of policy design, investment setting, and collaborative paradigms connecting innovation with inclusion (Sami et al., 2023).

The EduTech market in Bangladesh is growing in an environment of mobile-first, lower-middle-income, characterized by high rates of digitization and heterogeneous institutional capacity. In order to place Bangladesh, we compare it to Malaysia. Malaysia has the advantage of the Malaysia Education Blueprint, MyDIGITAL efforts, and Malaysia Digital Economy Corporation (MDEC)-driven programs that synchronize curriculum modification, teacher training and development, and digital infrastructure with consistent public-private models of delivery. In comparison, Bangladesh has high founder-led localization and high diffusion of smartphones but has thinner risk capital, slower licensing, and more stringent device/data affordability slew, especially outside of large cities. We pay attention to Bangladesh since it is a theoretically informative, most likely, but limiting case: technological enablers are present, scale and equity are all dependent on governance, affordability, and the depth of investment. The insights can be generalized to other emerging markets, whereas the Malaysia comparison demonstrates how the coherence of policy and investment pipelines can be used to expand on an inclusive basis (Burns, 2023).

Despite rapid platform growth, prior work on Bangladeshi EduTech has tended to examine adoption or business models in isolation, with limited integration of 1) entrepreneurial ecosystem mechanisms, 2) governance and regulatory readiness for online learning, and 3) the strategic role of data and innovation capabilities in education organizations.

Guided by an entrepreneurial ecosystem and digital-inclusion lens, we treat localization and cloud/artificial intelligence (AI) capabilities as strategic enablers, while regulation/governance and finance depth are modeled as institutional boundary conditions. This framing aligns with research emphasizing legal/regulatory foundations for online learning and the importance of data governance and innovation strategy in education systems (Xhafaj et al., 2022; Tridalestari & Prasetyo, 2024).

The structure of this paper is as follows. Section 2 reviews the relevant literature on EduTech, entrepreneurial ecosystems, and digital inclusion, and positions the Bangladesh-Malaysia comparison as a governance and strategy benchmark. Section 3 explains the research methodology (case selection, participants, data collection, analytic procedures, and quality/ethics safeguards). Section 4 reports within-case and cross-case results, including an urban-rural equity breakdown. Section 5 discusses the mechanisms and boundary conditions by linking our findings to prior studies and to recent work on governance and innovation strategy in education. Section 6 concludes with implications for policy, investors, and platform leaders, as well as limitations and directions for future research.

2. LITERATURE REVIEW

EduTech has now become the most revolutionary component of global education reform due to the cost-effective and ubiquitous curriculum overhaul achieved through its useful solutions to learning deficits and traditional system constraints (Cueto et al., 2023). Growth in internet connectivity, mobile penetration, and favourable governmental regulation have contributed to the fast pace of growth in the sector. The COVID-19 pandemic led some websites, including Coursera and Udemy, to vast growth and remote learning in general allowed massive scale and usage of cloud-based, adaptive, and mobile-first systems (Kumari et al., 2023; Shams, 2023). Mobile-first approaches have been especially successful in connecting with underserved communities in low-income economies, where they make it possible to circumvent the infrastructure limitations faced by learners in rural and low-income environments. The case in India, Kenya, and China shows that powerful digital learning policies coupled with the increasing desire in the market can be instrumental in developing innovation in the EduTech sector (Thorsteinsdóttir et al., 2021).

Governance and regulatory readiness are increasingly recognized as a core determinant of whether digital learning initiatives can move beyond episodic adoption to system integration. In developing-country contexts, the legal governance of online learning shapes institutional compliance, accreditation, and trust — all of which condition platform partnerships with schools and public programs (Xhafaj et al., 2022). Similarly, evidence from higher-education settings indicates that data governance capability (standards, stewardship, and culture) affects the reliability of learning analytics and the legitimacy of data-driven decision making (Tridalestari & Prasetyo, 2024). These insights help explain why technology features alone may not translate into equitable scale.

Recent strategy research also highlights that technological innovation in education organizations requires complementary organizational enablers (leadership, capability development, and implementation governance). For example, studies on higher education emphasize that successful innovation strategies depend on aligning technology with institutional processes and stakeholder readiness (Fernández et al., 2023; Jameson et al., 2022). In parallel, digital-economy research in emerging markets shows that innovation can raise performance only when capabilities and adoption conditions are in place (Heredia et al., 2022). Translating these arguments to EduTech suggests a "capability-plus-conditions" view: platforms scale fastest when localization and cloud/AI capabilities are paired with governance clarity, teacher capacity, and affordability supports.

Financing pipelines and de-risking instruments further shape inclusion. Evidence from emerging markets suggests that digital financial technologies can enable entrepreneurship development, but access and institutional arrangements determine who benefits (Emekaraonye & Ifelunini, 2026). Complementary evidence on ICT adoption strategies for small and medium-sized enterprises in emerging markets underscores the role of policy and capability building in diffusion and impact (Kumar et al., 2024; Faiz et al., 2024; Shahzad et al., 2023). For EduTech, this implies that blended and outcomes-linked finance may be necessary to underwrite rural rollouts, teacher professional development (PD), and quality assurance — areas where private returns are uncertain yet social returns are large.

The start-ups are of crucial importance as sources of EduTech innovation. They offer flexible and target-oriented education based on online tutoring, good old virtual classrooms, skills-based modules, and gamified learning. Their success is tied to digital infrastructure, the youth's desire to receive employability-related education, and the availability of venture capital. The pandemic stimulated the growth of resilient and scaling models, and nowadays platforms that can provide remote delivery of instructions and track learners' progress, remaining in real-time, are emerging (Amit et al., 2024). In Bangladesh, emerging evidence on micro-credentials suggests that short, stackable certificates can expand access to skills pathways, but their value depends on institutional recognition and quality assurance (Ahad et al., 2025). Recent evidence from Bangladeshi higher-education settings suggests that AI-enabled learning can expand academic opportunities, but its impact depends on institutional capability and quality assurance (Tamanna & Sinha, 2025).

Entrepreneurial ecosystem theory, particularly Isenberg's (2016) framework, provides a relevant analytical lens for examining the development of EduTech in Bangladesh. This is a model that lays more stress on the interaction between policies, culture, institutional support, financing, as well as human capital. On the one hand, enabling conditions provided by such projects as Digital Bangladesh have allowed this country to continue experiencing gaps in investment, institutional capacity, and policy consistency (Dia et al., 2024). The need to create better affordability and usability of the platform remains central to the growth in the sector, as well as digital literacy, particularly in rural locations.

Even though there are good developments, the EduTech ecosystem in Bangladesh is faced with structural challenges. More than 90 million citizens have access to the internet; however, affordability is a huge limitation, especially in rural settings, where citizens cannot easily access smartphones and data plans (Rodriguez-Segura, 2022; Hosen & Habib, 2024). Digital illiteracy, in both teachers and students, decreases the effectiveness of using online tools, with regulatory uncertainty and general lack of investor interest acting as an obstacle to long-term sustainability. The use of digital learning is further restricted by a cultural reluctance to adopt, particularly by the parents and traditional institutions (Economic and Social Commission for Asia and the Pacific [ESCAP], 2022; Mangaraj & Reddy, 2022).

However, local start-ups like 10 Minute School, Shikho, and Bohubrihi have been the first to offer localized, low-cost services in line with the national curriculum. These platforms fill in skills gaps in the youth labor market by integrating interactive mobile learning into competency-based training. Nonetheless, the digital divide still exists since learners in rural areas continue to have problems with access and affordability of the products and services, and most starters have not had good alliances with government stakeholders or corporate players.

The literature severely lacks in the case of EduTech entrepreneurship in Bangladesh. Most of the worldwide studies dwell on markets like the United States, India, and China, but hardly pay much attention to the peculiarities of policy, investor, and sociocultural processes forming the ecosystem of Bangladesh (Eum, 2025). Localization of digital education research has been urgently needed to consider the linguistic differences, the inequalities geographically as well as the infrastructural constraints.

Unambiguously, this study, related to the comparison of Malaysia, there is comparative evidence of coordinated policy rails and programmatic finance crowding-in private investment and classroom integration anchor. The MyDIGITAL strategy of Malaysia, agency-based initiatives (e.g., MDEC), and school-based ICT provisioning generate a predictable demand and integration channels of platforms, which complement market dynamics and minimize the risk of adoption (Economic Planning Unit, Prime Minister's Department of Malaysia, 2021). Analysis of cases demonstrates that such orchestration is the complement of entrepreneurial innovation because it reduces approval times, aligning teacher PD with digital content, and indicating long-term state investment (Dia et al., 2024). This is the opposite of diffusion, which is more entrepreneur-driven in Bangladesh, with fragmented procurement and thin sector-specific risk capital limiting scale inclusion despite high user demand (ESCAP, 2022).

This paper will focus on closing that gap by carrying out a qualitative inquiry, utilizing case studies of how technology, policy, and market forces interact. It also indicates enablers and inhibitors

within the EduTech sector in Bangladesh based on these findings giving evidence-based specifications on the development of an entrepreneurial ecosystem that is more inclusive, scalable, and sustainable into a more inclusive process.

3. RESEARCH METHODOLOGY

3.1. Design and rationale

To capture in a qualitative and multi-case study that is not easily measured and to have the ability to generalize analysis, we used an exploratory and qualitative multi-case study (Pellini et al., 2021; Cueto et al., 2023). We used an exploratory multi-case design to surface mechanisms not visible in aggregates and to enable analytic generalization across varied product scopes and localization depths (Rodriguez-Segura, 2022; United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2023).

3.2. Case selection

A sample of maximum variation was selected to represent a heterogeneous set of models, as three top Bangladeshi EduTech ventures (10 Minute School, Shikho, Bohubrihi) were selected based on the scale, product focus, depth of localization, and level of funding (ESCAP, 2022; Cueto et al., 2023).

3.3. Participants

We conducted 27 semi-structured interviews: founders/senior managers (six), instructors/content designers (six), students/parents (seven), investors/accelerator mentors (four), and policy/industry actors (four); and four focus groups (~28 participants: two teacher groups, two student groups, ~seven each). Inclusion required direct involvement in platform building, governance, or use within the past 24 months (Cueto et al., 2023; UNESCO, 2023). For equity analysis, each interview was tagged by self-reported residence and primary study location (urban n = 15; rural/peri-urban n = 12), enabling an urban–rural contrast in subsection 4.7.

3.4. Data collection

All sessions followed approved ethical procedures; written informed consent was obtained, pseudonyms were used, and all audio was recorded and professionally transcribed.

3.4.1. Interviews

We conducted semi-structured interviews lasting 60–90 minutes in Bangla/English, delivered online or face-to-face. The common guide covered product strategy, pedagogy, and content localization, technology stack (cloud/AI), user segments, affordability/cost structure, growth constraints, regulatory touchpoints, partnerships, and observed outcomes. Sample stems included:

1. What is the impact of device/data cost on uptake outside major cities?
2. What were the regulatory measures that slowed down deployment or alliances?
3. In which area did cloud/AI reduce cost-to-serve or enhance progression?
4. What teacher-PD provides supported sustained classroom use?

These stems are consistent with ecosystem and digital-inclusion notions that have been highlighted in recent syntheses (Pellini et al., 2021; GSM Association [GSMA], 2023; UNESCO, 2023).

3.4.2. Focus groups

We ran four 90-minute focus groups (two teacher groups, two student groups) that probed affordability, usability, trust, and learning experience, with short artifacts (screens/snippets) used as prompts where relevant (Cueto et al., 2023).

3.4.3. Document analysis

We analyzed pertinent ICT/education policy documents, platform reports, investor decks, and market studies to triangulate claims emerging from interviews and focus groups and to contextualize findings within sector policy and financing trends (ESCAP, 2022; Economic Planning Unit, Prime Minister's Department of Malaysia, 2021).

3.5. Data analysis

We conducted reflexive thematic analysis using a hybrid codebook that combined deductive ecosystem/digital-inclusion constructs with inductive open codes. Two researchers double-coded an initial ~20% subset, reconciled differences, refined code definitions, and then coded the full corpus with memoing and an audit trail (protocol, codebook versions, decision logs, and matrices) (Braun & Clarke, 2021; Cueto et al., 2023; UNESCO, 2023). Constant comparison was applied iteratively by 1) comparing coded incidents within each case to test whether a theme held across stakeholder roles, 2) comparing the same code across the three ventures to identify convergence and divergence, and 3) contrasting urban vs. rural/peri-urban respondents using cross-case matrices. Disconfirming evidence was retained and used to tighten interpretations. Table 1 presents the final hybrid codebook used for analysis.

Table 1. Hybrid codebook (deductive + inductive) with definitions and examples

Code type	*Code*	*Definition/indicators*	*Illustrative example*
Deductive	Localization/curriculum alignment	Content mapped to national syllabus, Bengali language, exam-season fit; cues of credibility and relevance	"*Localized content is what builds credibility during exam time*" (Founder, personal communication, January 1, 2025)
Deductive	Cloud scalability	Elastic hosting, auto-scaling, and uptime during peak usage (e.g., live revision weeks)	"*Cloud auto-scaling rescued us during live revision weeks*" (Founder, personal communication, January 10, 2025)
Deductive	AI-enabled guidance	Recommendations, diagnostics, adaptive sequencing, automated feedback, and perceived usefulness	"*It recommends what to watch next; it saves search time*" (Student, personal communication, January 20, 2025)
Deductive	Affordability (device/data)	Smartphone availability, data-pack cost, payment friction, trade-offs in usage	"*When data packs are expensive, I choose videos only for subjects I fear most*" (Student, personal communication, January 25, 2025)
Deductive	Rural connectivity constraints	Weak coverage, buffering, drop-offs, limited live participation, and offline needs	"*Rural learners buffer or drop during live classes, then miss the Q&A* [questions and answers]" (Instructor, personal communication, January 31, 2025)
Deductive	Governance/regulatory friction	Licensing, procurement, accreditation timelines, unclear rules, and compliance burden	"*Procurement runs can be longer than the runway of the start-up*" (Policy actor, personal communication, February 10, 2025)
Deductive	Finance depth/de-risking	Availability of venture capital, ticket-size fit, blended finance, and public risk-sharing	"*Rural growth tickets are hard to justify without public de-risking*" (Investor, personal communication, February 20, 2025)
Inductive	Trust & legitimacy cues	Signals that reduce parental/school skepticism (brand, teacher endorsement, certification)	Parents asked for "school-recognized" badges before paying (Parent, personal communication, March 1, 2025)
Inductive	Exam-driven demand spikes	Seasonal surges around national exams; episodic engagement patterns	Users "come heavily before exams" and then reduce usage (Manager, personal communication, March 15, 2025)
Inductive	Teacher PD as an adoption bridge	Training, onboarding, lesson integration routines, and teacher confidence with tools	Teachers wanted "hands-on training" to use content in class (Teacher, personal communication, April 1, 2025)

Source: Authors' coding framework and audit trail.

3.6. Ethics

In order to maintain anonymity, pseudonyms were used; raw files and identifiers are stored in secure storage with limited access. Their participation was voluntary and not mandatory, with the option of dropping out. Ethics was followed according to the recent recommendations about the use of evidence and fairness in education with the use of technologies (Pellini et al., 2021; UNESCO, 2023).

3.7. Alternative methodological options

While this study uses a qualitative multi-case design to surface mechanisms, other approaches could complement or extend the evidence base. A large-N survey of learners, parents, and teachers could quantify adoption drivers, willingness-to-pay, and equity gaps across districts; platform-telemetry analysis could test progression pathways and feature usage at scale; and mixed-methods designs could triangulate qualitative mechanisms with measurable learning outcomes. Quasi-experimental evaluations (e.g., difference-in-differences or matched comparisons) would be suitable where staggered rollouts or policy changes create natural experiments. These alternatives are priorities for future research because they can validate and generalize the mechanisms identified here.

4. RESULTS

4.1. How the evidence is summarized

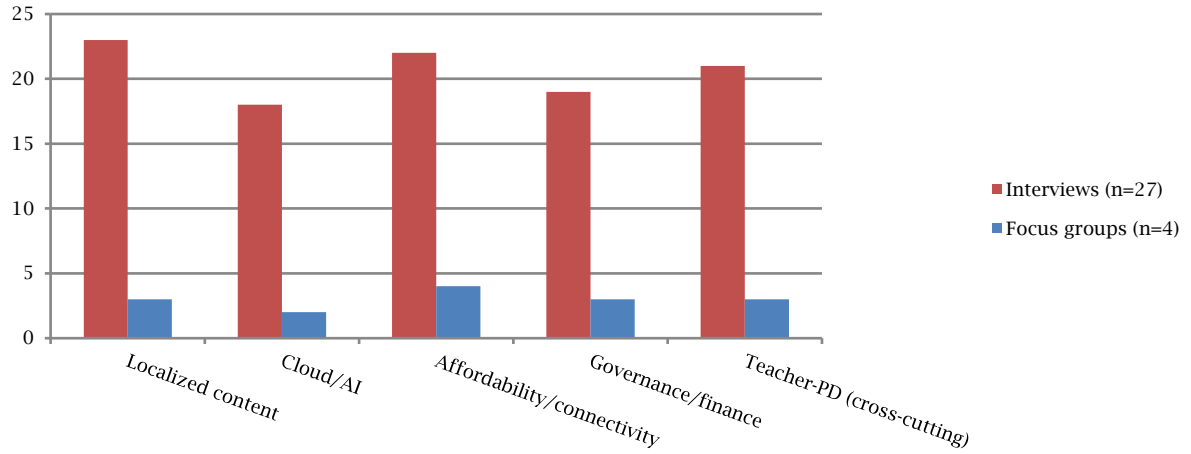
In the coding process, binary agreement (present/absent) by each core theme was indicated. The denominations will be set to 27 interviews and four focus groups. Reporting less than that amounts to explicit agreement; brief anonymized snippets depict the rationale (Rodriguez-Segura, 2022; Cueto et al., 2023; UNESCO, 2023).

Table 2. Theme-wise agreement tallies (interviews n = 27; focus groups n = 4)

Core theme	*Interviews agreeing (n/27)*	*Focus groups agreeing (n/4)*	*Interviews (%)*	*Focus groups (%)*
Localized, curriculum-aligned content boosts engagement (Catalyst)	23/27	3/4	85%	75%
Cloud/AI reduces cost-to-serve and guides progression (Catalyst)	18/27	2/4	67%	50%
Affordability & rural connectivity constrain uptake (Barrier)	22/27	4/4	81%	100%
Governance frictions & thin finance limit scale (Barrier)	19/27	3/4	70%	75%
Teacher-PD is necessary for durable classroom use (Cross-cutting)	21/27	3/4	78%	75%

Source: Authors' coding of interview and focus-group transcripts.

Figure 1. Agreement tallies by theme (counts)



Note: X-axis: core themes; Y-axis: agreement count. Percent agreement is reported in Table 1 (interviews n = 27; focus groups n = 4).

4.2. Theme 1 — Localized, curriculum-aligned content drives engagement (Catalyst)

Agreement: 23/27 interviews; 3/4 focus groups.

Excerpts:

- Founder (Case A): "*We are good at delivering features fast, but localized content is what builds credibility during exam time*" (personal communication, April 5, 2025).
- Teacher (FG-1): "*I can cover gaps in a short time, but only when it comes to syllabus checkpoints: two lessons can be covered by short and app-based lessons*" (personal communication, April 10, 2025).

Interpretation: Localization minimizes cognitive load and increases perceived usefulness, which aligns with reviews, which likely focus on curriculum alignment and teacher mediation (Rodriguez-Segura, 2022; Cueto et al., 2023; UNESCO, 2023).

4.3. Theme 2 — Cloud delivery and AI-enabled guidance lower cost-to-serve (Catalyst)

Agreement: 18/27 interviews; 2/4 focus groups.

Excerpts:

- Founder (Case B): "*Cloud auto-scaling rescued us when we were in live revision weeks*" (personal communication, April 15, 2025).
- Student (FG-3): "*The app will recommend what to watch next; it saves the search time*" (personal communication, April 20, 2025).

Interpretation: While cloud elasticity and AI-based sequencing were repeatedly described as enabling growth, agreement was lower than for localization because benefits were uneven across cases and user contexts. Most agreement came from the two high-traffic, exam-aligned platforms (Cases A and B), where auto-scaling and recommendation features are visible during peak-demand periods. Disagreement clustered in Case C and among rural/peri-urban respondents who experienced buffering, older devices, and limited data, which reduced the perceived value of streaming-heavy features and made recommendations feel less actionable. Several instructors also noted that AI guidance was "good enough" for navigation but insufficient for diagnostic feedback without more granular assessment data. This variance suggests cloud/AI acts as a conditional catalyst: it lowers cost-to-serve and supports progression when bandwidth and device constraints do not dominate (Cueto et al., 2023; UNESCO, 2023).

4.4. Theme 3 — Affordability and rural connectivity are binding constraints (Barrier)

Agreement: 22/27 interviews; 4/4 focus groups.

Excerpts:

- Student (FG-3): "*When data packs are expensive, I choose videos only for subjects I fear most*" (personal communication, April 22, 2025).
- Instructor (Case C): "*Rural learners buffer or drop during live classes, then miss the Q&A*" (personal communication, April 24, 2025).

Interpretation: Relatively high device/data costs and lack of coverage are inhibiting sustained use and conversion between free and paid plans (GSMA, 2023; ESCAP, 2022).

4.5. Theme 4 — Governance frictions and thin sector finance limit scale (Barrier)

Agreement: 19/27 interviews; 3/4 focus groups.

Excerpts:

- Policy actor: "*Procurement runs can be longer than the runway of the start-up*" (personal communication, April 26, 2025).
- Investor/mentor: "*The ticket sizes for rural growth are hard to justify without public de-risking*" (personal communication, April 29, 2025).

Interpretation: Governance and finance constraints were widely perceived as binding, but not uniformly so. Agreement was strongest among founders, investors, and policy actors who had direct experience with procurement cycles, accreditation, or public-school partnerships. The eight interviews that did not flag this barrier were primarily from instructors/students and from venture segments that scaled through direct-to-consumer channels (e.g., exam preparation) with limited reliance on formal institutional procurement. In these accounts, affordability and household decision-making were viewed as more immediate

than regulatory friction. Taken together, the pattern indicates that governance/finance frictions become most salient when ventures attempt to move from household adoption to system integration (schools, public programs, and district-level rollouts), where time-bound approvals and public de-risking are pivotal (Pellini et al., 2021; ESCAP, 2022).

4.6. Cross-case synthesis

There is engagement boosting (catalyst) through localization (localization), and cost reduction (localization), but limits (affordability/connectivity; governance/finance) on an inclusive scale. Teacher-PD and assessment alignment are also important in the case of durable classroom use (UNESCO, 2023).

4.7. Urban–rural contrast (equity lens)

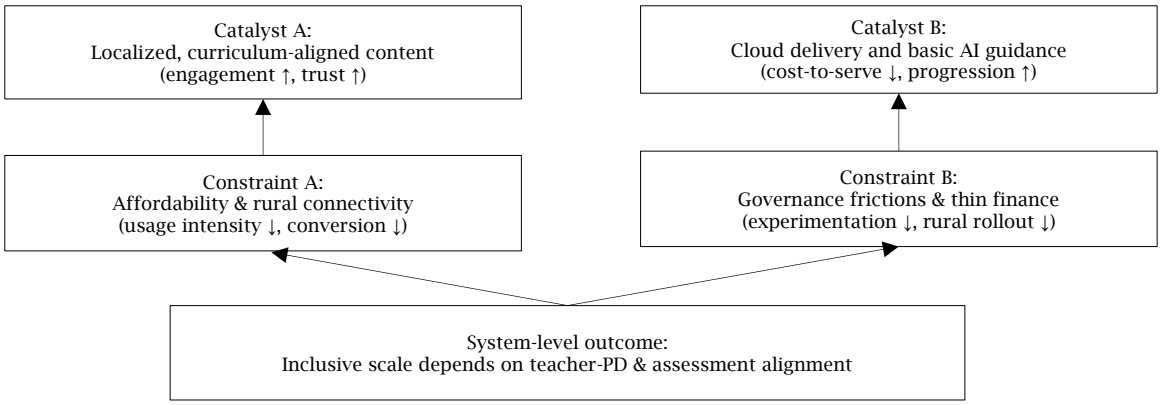
To operationalize the rural–urban distinction described in subsection 3.3, we compared agreement flags for respondents who primarily studied/used platforms in urban settings (n = 15) versus rural/peri-urban settings (n = 12). As expected, affordability and connectivity constraints were near-universal in rural/peri-urban accounts, with repeated descriptions of buffering, shared devices, and data rationing. The same constraint also helps explain the lower salience of the cloud/AI catalyst in rural settings: when bandwidth dominates the user experience, cloud reliability and AI sequencing are less visible and less trusted. Table 3 summarizes the contrast.

Table 3. Urban-rural agreement by theme (interviews only)

Core theme	*Urban (n/15)*	*Urban (%)*	*Rural/peri-urban (n/12)*	*Rural/peri-urban (%)*
Localized, curriculum-aligned content (Catalyst)	13/15	87%	10/12	83%
Cloud/AI delivery and guidance (Catalyst)	12/15	80%	6/12	50%
Affordability and connectivity constraints (Barrier)	10/15	67%	12/12	100%
Governance/finance frictions (Barrier)	10/15	67%	9/12	75%
Teacher-PD for durable classroom use (Cross-cutting)	12/15	80%	9/12	75%

Note: Urban n = 15; rural/peri-urban n = 12.
Source: Authors' coding of interview transcripts with locale tags.

Figure 2. Mechanism bundle for scaling EduTech



Note: Catalysts (localization; cloud/AI) and constraints (affordability/connectivity; governance/finance) jointly shape inclusive scale.

5. DISCUSSION

5.1. Boundary conditions and mechanisms

Linking to prior evidence, our localization catalyst aligns with research arguing that context-fit content and teacher mediation are central to learning impact in low-resource environments, where generic content often fails to match curricular pacing and assessment regimes. Likewise, our finding that cloud/AI benefits are conditional echoes broader EduTech syntheses: advanced features generate value when infrastructure and device constraints do not dominate the user experience, but become less salient when bandwidth and affordability are binding constraints. By adding an explicit urban–rural contrast, this paper clarifies an equity mechanism: technology capabilities can amplify inclusion only when "last-mile" constraints are mitigated.

We also extend governance-oriented scholarship by showing how ventures experience regulation and institutional readiness differently depending on their go-to-market path. Direct-to-consumer exam preparation models can scale with limited institutional interaction, while school integration triggers governance and data-handling requirements that raise transaction costs. This is consistent with work on online learning governance and data governance in education, which suggests that compliance, legitimacy, and data stewardship are prerequisites for durable institutional partnerships (Xhafaj et al., 2022; Tridalestari & Prasetyo, 2024).

Results show that there is a bundle of mechanisms: localized content ↑ relevance; cloud/AI ↓ cost-to-serve; however, the conditions of affordability and governance/finance decide who gains and at what level — reflecting synthesis work on alignment, PD, and affordability (Rodriguez-Segura, 2022; Cueto et al., 2023; UNESCO, 2023).

5.2. Comparative lens (Bangladesh vs. Malaysia)

The Bangladesh-Malaysia comparison clarifies how ecosystem conditions shape the move from platform growth to inclusive scale. Bangladesh demonstrates strong localized demand, but affordability constraints, fragmented approvals, and limited risk capital slow broader integration. Malaysia, in contrast, shows how coordinated policy, teacher-PD pathways, and programmatic finance can support faster and more predictable adoption.

1. Why Bangladesh? A case that is most likely but limited, i.e., a high demand and localization by founders within the context of affordability limits, coverage gaps in rural areas, and fragmented adoption routes (ESCAP, 2022; GSMA, 2023).

2. What does Malaysia clarify? MyDIGITAL plus agency orchestration (e.g., MDEC) and teacher-PD pipelines generate foreseeable school-integration and finance crowd-in impacts time-to-adoption compression (Economic Planning Unit, Prime Minister's Department of Malaysia, 2021; Dia et al., 2024).

Table 4. Enabling conditions — Bangladesh vs. Malaysia (interpretive summary)

Dimension	*Bangladesh*	*Malaysia*
Policy rails and orchestration	Fragmented approvals; *ad hoc* procurement	MyDIGITAL; agency orchestration; clear pathways
Finance depth and fit	Thin EduTech risk capital; few outcomes-linked tools	Programmatic grants; public-private partnerships (PPPs); crowd-in effects
Affordability and access	High device/data burden outside cities; patchy rural coverage	Lower relative burden; stronger school ICT
School integration and PD	Limited teacher-PD; exam-season spikes	Teacher-PD pipelines; classroom integration
Localization	Strong Bengali, exam-aligned content	Bilingual content; institutional integration

Source: Authors' synthesis of interview data and policy/sector documents (2021–2024).

Inference: The comparison identifies three high leverage public interventions in the case of Bangladesh: 1) targeted devices/data relief (education bundles, vouchers); 2) simplified accreditation/procurement (one-stop, time-bound approvals); and 3) outcomes-linked/blended finance to underwrite rural rollout and teacher empowerment (Pellini et al., 2021; ESCAP, 2022; Economic Planning Unit, Prime Minister's Department of Malaysia, 2021).

5.3. Practical implications

The practical implications may be summarized as follows:

1. Affordability levers: The data packages/vouchers of low-income districts are maintained in order to continue usage beyond the exam spikes (GSMA, 2023).

2. Regulatory streamlining: Time-boxed accreditation/renewal portal in a single window to minimize uncertainty and allow schools to uptake it (Pellini et al., 2021).

3. Blended finance: Grants/concessional credit results in rural node, teacher-PD and inclusive content where private return on investment is not known (ESCAP, 2022).

4. Integration with schools: Co-develop PD and assessment alignment to anchor use in classroom routines (UNESCO, 2023).

5. Evidence loops: Equity of access, progression, completion, real-time course-correction shared (PPP) key performance indicators.

6. CONCLUSION

The EduTech industry in Bangladesh presents a mixed growth at a rate of rapidity. Two accelerators — localized, curriculum-based content and cloud/AI-based delivery enhance participation and reduce cost-to-serve; two bottlenecks — affordability/connectivity and governance/finance bottlenecks restrict inclusive scale. The Malaysia contrast explains the levers that can convert the entrepreneur-led momentum to include the system level: device/data relief, single-window approvals, outcomes-linked/blended finance, and teacher-PD/assessment integration (Pellini et al., 2021; ESCAP, 2022; GSMA, 2023; Economic Planning Unit, Prime Minister's Department of Malaysia, 2021; UNESCO, 2023). Collectively, these initiatives can transform islands of excellence into predictive and fair access-to-outcomes pathways.

This study draws on three leading ventures and stakeholder accounts; therefore, it prioritizes depth and analytic generalization rather than statistical representativeness. Responses may be influenced by recall and by the interview contexts (online vs. in-person). Future research should combine qualitative mechanisms with platform telemetry, household affordability panels, and school-level implementation data to test whether targeted data/device subsidies, streamlined approvals, and outcomes-linked finance measurably improve adoption, progression, and learning outcomes — especially in rural and peri-urban settings. A further priority is to examine data governance capacity and regulatory compliance pathways as platforms move from household uptake to institutional integration.

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