



WHY SMALL HOTELS DON'T TRAIN: EMPLOYER PARTICIPATION BARRIERS IN DUAL VOCATIONAL EDUCATION IN UZBEKISTAN'S HOSPITALITY SECTOR

Sardor Saidrasulov

Article DOI: <https://doi.org/10.36713/epra26949>
DOI No: 10.36713/epra26949

ABSTRACT

Purpose: Small and medium-sized enterprises (SMEs) constitute over 80 percent of hospitality employers in Uzbekistan, yet their participation rate in dual vocational education and training (VET) programmes remains below 15 percent, severely constraining the scalability of the government's dual education agenda. This paper examines the structural and institutional barriers that inhibit SME participation in dual education placements in Uzbekistan's hospitality sector, drawing on original survey data from 215 enterprises and 48 key informant interviews conducted across four oblasts in 2023.

Design/methodology/approach: A mixed-methods design combines quantitative analysis of a purpose-built enterprise survey with qualitative thematic analysis of stakeholder interviews. Barriers are mapped against an analytical framework adapted from Euler's (2013) enterprise training decision model and Wolter and Ryan's (2011) training investment calculus, contextualized within Uzbekistan's transitional institutional environment.

Findings: Six barrier clusters are identified: (1) administrative and contractual complexity; (2) uncertainty about apprentice net productivity during training; (3) absence of qualified in-house enterprise trainers; (4) lack of fiscal incentives; (5) regulatory ambiguity around enterprise obligations; and (6) weak intermediary infrastructure. Barriers are significantly moderated by enterprise size, international brand affiliation, and geographic location. SMEs in regional cities face compounded disadvantages relative to large internationally branded hotels in Tashkent.

Originality/value: This is the first empirical study to systematically map dual VET employer participation barriers in a Central Asian hospitality sector context. The paper advances a context-sensitive governance model – the Graduated Participation Pathway (GPP) – as a practical policy instrument for progressively integrating SMEs into dual education systems in transition economy hospitality markets.

INTRODUCTION

The dual education system — in which apprentices divide their learning time between a vocational college and a host training enterprise — has emerged as the internationally preferred mechanism for aligning workforce skills with employer demand in the hospitality and tourism sector (OECD, 2020; ILO, 2023). The logic is compelling: service sector competencies are inherently context-dependent, and authentic workplace learning provides cognitive scaffolding that classroom instruction alone cannot replicate (Lave & Wenger, 1991). Switzerland and Germany, the paradigmatic dual VET countries, demonstrate youth unemployment rates below 5 percent and employer satisfaction rates exceeding 80 percent in hospitality — performance benchmarks that have attracted policy interest across the developing world (SERI, 2023; BIBB, 2023).

Uzbekistan, embarked on an ambitious tourism development trajectory targeting 25 million annual visitors by 2030, has legislatively committed to dual education as its primary VET modernization instrument. Since 2019, the Swiss Agency for Development and Cooperation (SDC), through its DEVET programme, has piloted dual education in the hospitality sector across four colleges and 28 enterprises, demonstrating proof-of-concept. Yet the programme's own monitoring data reveal a persistent structural problem: enterprise recruitment falls consistently below target, with SME operators — representing the vast majority of the hospitality market — notably absent. Of 28 participating enterprises, 21 are large hotels with international brand affiliation; fewer than seven are independently operated restaurants, guesthouses, or boutique hotels with under 50 rooms.

This paper asks: what specific barriers prevent SMEs in Uzbekistan's hospitality sector from participating as dual education training enterprises, and what governance mechanisms could progressively overcome them? The question is not merely operational — it is foundational. A dual education system in which training is concentrated in large international



hotels reproduces existing labour market inequalities, channels the most talented VET graduates toward multinational employers, and fails to develop the broader sector quality that Uzbekistan's tourism ambitions require. Unless dual VET reaches the SME hospitality market, it cannot transform the national workforce at scale.

The paper makes three contributions. First, it provides the first empirical quantitative profile of dual VET employer participation barriers in a Central Asian context. Second, it advances the theoretical understanding of training enterprise decision-making in transitional institutional environments where neither market incentives nor regulatory obligations are well-established. Third, it proposes the Graduated Participation Pathway (GPP) as a governance instrument specifically designed for SME-dominated hospitality markets in middle-income transition economies.

THEORETICAL FRAMEWORK

2.1 The Enterprise Training Decision

The decision of a firm to participate as a dual education training enterprise is conventionally analysed through a cost-benefit framework. Wolter and Ryan (2011), drawing on the Swiss SFIVET longitudinal enterprise panel, identify four determinants of the training investment decision: the gross costs of training (trainer time, equipment, administrative overhead); the productive output of apprentices during training (which partly offsets gross costs); the post-training benefits of retaining a trained worker (reduced recruitment and induction costs); and the regulatory and social norm environment that shapes the salience of these costs and benefits to decision-makers.

In the Swiss and German contexts, enterprise-level net training costs are on average modest or even negative — meaning enterprises collectively benefit financially from training, once productive apprentice output is credited (Strupler & Wolter, 2012; BIBB, 2022). This favourable cost-benefit balance is the product of decades of institutional development: training is embedded in workplace routines, apprentice progression is structured to generate increasing productivity, and the regulatory and examination infrastructure reduces coordination costs. In a nascent dual education system, none of these conditions holds. Enterprises face high setup costs, low initial apprentice productivity, uncertain institutional support, and no fiscal compensation — making the raw cost-benefit calculus deeply unfavourable.

2.2 Institutional Context and Barrier Typology

Euler (2013) extends the cost-benefit model to incorporate three categories of enterprise training motivation: instrumental motivations (direct economic benefit), pedagogical motivations (commitment to youth development and social responsibility), and reputational motivations (employer branding, staff loyalty). In transition economy contexts, instrumental motivations dominate because the institutional conditions for pedagogical and reputational motivations — social partnership traditions, employer association norms, recognized training enterprise status — are weakly developed.

Complementing Euler's model, this paper draws on the institutional complementarities framework (Hall & Soskice, 2001) to argue that SME participation barriers in transitional dual VET systems are not merely firm-level calculation problems but systemic governance failures: the absence of functioning legal frameworks, financial intermediaries, quality assurance bodies, and professional intermediary organizations creates a coordination vacuum that no individual firm can resolve alone. This systemic perspective informs both the analytical framework for barrier identification and the design of the GPP governance model.

Building on this theoretical grounding, the paper employs a six-cluster barrier typology — administrative, productivity, trainer capacity, fiscal, regulatory, and intermediary — as the organizing structure for empirical analysis. This typology adapts Mühlemann et al.'s (2018) barrier framework for Swiss SME non-participation, adjusting for the specific institutional context of Uzbekistan as a transition economy with nascent dual VET infrastructure.

METHODOLOGY

3.1 Research Design

A sequential mixed-methods design was employed. In Phase 1 (April–July 2023), a purpose-built structured survey was administered to 215 hospitality enterprises across four oblasts: Tashkent City, Samarkand, Bukhara, and Fergana. In Phase 2 (August–November 2023), 48 semi-structured key informant interviews were conducted with hotel general managers, restaurant owners, VET college directors, SDC/DEVET programme officers, government officials, and employer association representatives. Quantitative data informed interview guide development; qualitative data provided interpretive depth and surfaced mechanisms not captured by survey items.



3.2 Survey Instrument and Sample

The survey instrument comprised 34 items across five sections: enterprise profile, current training practices, awareness and attitudes toward dual education, barrier significance ratings (5-point Likert scale, 1 = not significant, 5 = very significant), and enabler preferences. The instrument was developed through iterative expert review (two SDC/DEVET programme officers, three VET researchers, two hotel HR directors) and piloted with 15 enterprises before finalisation. It was administered in Uzbek, Russian, and English by trained enumerators through face-to-face interviews with enterprise decision-makers (general managers, owners, or HR directors).

The sample was drawn from the HRAU (Hotel and Restaurant Association of Uzbekistan) enterprise registry, stratified by size (small: <20 employees; medium: 21–100; large: >100), enterprise type (hotel, restaurant, guesthouse, café/bar, event venue), and geographic location. Response rate was 78 percent (215 completed of 275 approached). Table 1 presents the sample profile.

Table 1. Survey Sample Profile (n = 215)

Characteristic	Category	n	%
Enterprise size	Small (<20 employees)	94	43.7%
	Medium (21–100 employees)	81	37.7%
	Large (>100 employees)	40	18.6%
Enterprise type	Hotel / Guesthouse	112	52.1%
	Restaurant / Café	78	36.3%
	Event venue / Other	25	11.6%
Location	Tashkent City	89	41.4%
	Samarkand Oblast	55	25.6%
	Bukhara Oblast	42	19.5%
	Fergana Oblast	29	13.5%
Int'l brand affiliation	Yes	38	17.7%
	No	177	82.3%
Current dual VET participation	Active participant	26	12.1%
	Past informal placement only	41	19.1%
	No engagement	148	68.8%

3.3 Qualitative Data Collection and Analysis

Key informant interviews averaged 62 minutes and were audio-recorded with consent. Recordings were transcribed and translated into English by a professional bilingual research assistant, with back-translation verification for a 20 percent subsample. Thematic analysis followed Braun and Clarke's (2006) framework: familiarization, initial coding, theme development, review, definition, and write-up. NVivo 14 was used for coding management. Two researchers independently coded a 25 percent subsample; inter-rater reliability (Cohen's kappa) was 0.81, indicating strong agreement.

3.4 Ethical Considerations

Ethical approval was granted by the institutional review board of the lead author's university. Enterprise anonymity was assured; no enterprise names appear in published outputs. Participation was voluntary and no incentives were provided. Informed consent was obtained from all interview participants prior to recording.

FINDINGS

4.1 Overall Barrier Profile

Table 2 presents mean significance scores for the 18 individual barrier items, grouped by the six theoretical clusters. Items rated above 3.5 (on a 5-point scale) are considered high-significance barriers; those above 4.0 are critical barriers.



Table 2. Barrier Significance Ratings — All Enterprises (n = 215)

Barrier Cluster	Specific Barrier Item	Mean (SD)	% Rating ≥4
Administrative & Contractual	Complexity of training contracts and legal paperwork	4.21 (0.74)	78%
	Difficulty aligning college timetables with enterprise operations	3.98 (0.82)	64%
Productivity Uncertainty	Uncertainty about enterprise liability for apprentice accidents/errors	4.07 (0.79)	71%
	Apprentices disrupt service delivery during training	4.33 (0.68)	83%
	Unclear how long before apprentices become productively useful	4.18 (0.71)	76%
	Risk of investing in training and losing the apprentice to a competitor	3.87 (0.91)	61%
Trainer Capacity	No qualified in-house trainer / mentor available	4.09 (0.77)	72%
	Difficulty releasing experienced staff to supervise apprentices	3.92 (0.84)	63%
	Lack of pedagogical training for existing technical staff	3.76 (0.89)	55%
Fiscal	No financial compensation for training costs	4.44 (0.61)	88%
	No tax incentive linked to training investment	4.29 (0.67)	81%
	Training equipment / workspace requirements are costly	3.71 (0.94)	52%
Regulatory Ambiguity	Unclear what legal obligations apply to training enterprises	4.18 (0.75)	75%
	Fear of labour inspection arising from apprenticeship contract	3.83 (0.88)	58%
	Uncertainty about student insurance and social security status	3.96 (0.81)	66%
Intermediary Infrastructure	No single contact point for setting up a placement	4.02 (0.78)	68%
	College coordinators do not visit enterprise or support mentors	3.88 (0.85)	61%
	No inter-company training facility to supplement enterprise capacity	3.64 (0.93)	49%

The highest-rated barriers fall in the fiscal cluster (no financial compensation: M=4.44; no tax incentive: M=4.29) and the productivity uncertainty cluster (disruption to service: M=4.33). These findings are consistent with Mühlemann et al.'s (2018) analysis of Swiss SME non-participation, in which upfront costs and uncertain returns dominated the non-training decision. The strong showing of administrative complexity and regulatory ambiguity as critical barriers (both above 4.0) is particularly notable and reflects the specific institutional immaturity of Uzbekistan's dual VET legal framework.

4.2 Barrier Variation by Enterprise Size

Disaggregating by enterprise size reveals significant differential barrier profiles (Table 3). Small enterprises rate fiscal barriers and regulatory ambiguity significantly higher than large enterprises ($p < 0.01$, Mann-Whitney U test), while large enterprises rate trainer capacity barriers relatively higher — reflecting the organizational complexity of coordinating training alongside demanding operational environments in large branded properties.



Table 3. Mean Barrier Significance by Enterprise Size

Barrier Cluster	Small (<20 empl.) Mean	Medium (21–100) Mean	Large (>100) Mean	p-value (KW test)
Administrative & Contractual	4.28	4.01	3.74	< 0.01**
Productivity Uncertainty	4.42	4.21	3.98	0.03*
Trainer Capacity	3.88	4.02	4.31	< 0.01**
Fiscal	4.67	4.44	3.89	< 0.001***
Regulatory Ambiguity	4.39	4.11	3.62	< 0.001***
Intermediary Infrastructure	4.11	3.94	3.55	0.02*

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ | KW = Kruskal-Wallis H test

These patterns have direct governance implications. Policies targeting small hospitality enterprises must prioritize fiscal relief and regulatory simplification. Policies targeting large enterprises must invest in trainer capacity development and pedagogical support.

4.3 The Role of International Brand Affiliation

Enterprises affiliated with international hotel brands (n=38) displayed markedly lower overall barrier ratings across all clusters (composite mean 3.41 vs. 4.18 for independent enterprises, $p < 0.001$). Qualitative interviews with managers of branded properties attributed this to three factors: embedded training cultures inherited from global brand standards (Hyatt, Marriott, and Hilton all operate mandatory internal training frameworks); human resources management capacity that facilitates mentorship planning; and familiarity with structured training from experience in other markets. As one GM of a major international chain commented:

"We already run our own certification programmes for every employee. Adding a VET apprentice to a department that already has learning objectives is not a big additional step. The challenge is that the college curriculum doesn't always match what we actually need." (Hotel GM, Tashkent, Interview 7)

The inverse finding — that branded hotels regard curriculum misalignment as their primary concern while independent SMEs remain blocked by basic cost and regulatory barriers — underscores the need for differentiated governance instruments rather than a one-size-fits-all approach.

4.4 Geographic Differentiation

Enterprises in Tashkent City rated barriers significantly lower than those in Samarkand, Bukhara, and Fergana oblasts across all clusters. The geographic gap was largest for the intermediary infrastructure cluster (Tashkent $M=3.62$ vs. regional $M=4.28$, $p < 0.001$), reflecting the concentration of the DEVET inter-company training facility, VET college coordination offices, and employer association support services in the capital. Regional enterprise managers described a near-complete absence of institutional support:

"Nobody has ever come from the college to explain what this dual programme actually means for us. I read about it in a newspaper article. If someone came and explained the process step by step, and told me there was a support fund, I would consider it seriously." (Guesthouse owner, Bukhara, Interview 31)

This finding points to a critical geographic equity problem: the dual VET pilot is functionally a Tashkent programme. Without deliberate regional outreach infrastructure — enterprise liaison officers, inter-company training satellite facilities, and regional employer association nodes — the benefits of dual education will remain geographically concentrated, failing to develop workforce quality in Uzbekistan's most important heritage tourism destinations.

4.5 Enabler Preferences

Survey respondents were asked to select the top three enablers that would most increase their willingness to participate. Figure 1 (described narratively below) shows the frequency distribution. Financial subsidies for training costs (selected by 81% of non-participating enterprises) and simplified, one-stop administrative onboarding (74%) were the two most preferred enablers by a substantial margin. Tax incentives for training investment ranked third (61%). Peer recognition schemes — such as a 'Training Enterprise of the Year' designation — attracted interest from 38% of respondents, concentrated among larger and more established operators. Access to pre-trained apprentices who had completed inter-company foundation courses before enterprise placement was selected by 44%, reflecting the productivity uncertainty barrier identified above.

Qualitative data elaborated the financial subsidy preference with important nuance. Several SME owners drew a distinction between a direct per-apprentice cash subsidy (which they feared would involve bureaucratic claims processes) and a reduced-administration mechanism such as a payroll levy rebate or a 'training voucher' redeemable against certified training costs. The governance design implication is that the instrument design of financial support matters as much as its quantum.



DISCUSSION

5.1 Interpreting the Barrier Profile

The findings confirm and extend the training investment literature in three important ways. First, fiscal barriers dominate the participation decision in Uzbekistan's hospitality SME context to a greater degree than in mature dual VET systems, where the productive output of apprentices creates a self-financing dynamic over the training period (Wolter & Ryan, 2011). In the Uzbek context, the absence of structured apprentice progression frameworks, the newness of the institutional arrangement, and the lack of any fiscal offset mechanism mean that enterprises face a pure cost with uncertain and distant returns. This is not a market failure in the conventional sense — it is a governance vacuum.

Second, regulatory ambiguity emerges as a more significant barrier than equivalent studies in established VET systems have found. Mühlemann et al.'s (2018) Swiss study, for instance, identifies regulatory barriers as relatively minor because the legal framework is complete and well-understood. In Uzbekistan, where secondary legislation on enterprise obligations, training contracts, and apprentice social security remains incomplete, legal uncertainty creates a deterrent effect that is rational: enterprises fear that formalizing an apprenticeship relationship will expose them to labour inspection scrutiny or create obligations they cannot fulfil. This regulatory risk perception must be addressed through legislative completion and clear, accessible guidance rather than through financial incentives alone.

Third, the intermediary infrastructure deficit — particularly in regional cities — represents a coordination failure that cannot be resolved by individual enterprise or college action. The near-complete absence of enterprise liaison officers, regional employer association support, and satellite inter-company training facilities in Samarkand, Bukhara, and Fergana means that transaction costs for SME participation are prohibitively high even for enterprises that are in principle willing. This finding aligns with Euler's (2013) emphasis on the role of intermediary organizations in reducing enterprise coordination costs, and with SDC's own programme theory which identifies intermediary capacity as a necessary condition for scale.

5.2 The Graduated Participation Pathway (GPP)

The findings collectively motivate the Graduated Participation Pathway (GPP) — a governance model designed to progressively lower enterprise participation barriers through a structured sequence of engagement levels, each with its own support package, obligation level, and recognition mechanism. The GPP responds to the evidence that different enterprise types face qualitatively different barrier configurations and that a single participation standard excludes the majority of the SME market.

The GPP comprises three participation tiers:

Table 4. The Graduated Participation Pathway — Tier Structure

GPP Tier	Enterprise Profile	Obligations	Support Package	Recognition
Tier 1: Observer Partner	Any enterprise; no trainer requirement	Host 1–2 observation visits/year; complete 1-page feedback form	Free orientation workshop; college liaison officer visit; inclusion in HRAU training enterprise directory	Certificate of Partnership; logo use
Tier 2: Placement Partner	Enterprise with designated mentor; ≥5 staff	Host 1 apprentice per semester (12 weeks); provide structured task log; attend 1 college coordination meeting	SDC/Fund subsidy of UZS 1.5M/apprentice; 40-hour mentor training (free); inter-company course slots for apprentice; monthly college support visit	Silver Training Enterprise status; tax deduction eligibility
Tier 3: Full Dual Partner	Certified enterprise with qualified trainer; ≥15 staff	Host 1+ apprentices full 2–3-year dual pathway; participate in examination commission; provide learning plan	Full per-apprentice state funding supplement; Training Enterprise Fund grants for equipment; Trainer advanced certification; preferential graduate recruitment access	Gold Training Enterprise; National Award eligibility; HRAU board VET Committee seat



The GPP's key design principles, derived from the barrier analysis, are: (1) graduated obligation, so that entry-level participation requires minimal administrative burden; (2) front-loaded support, so that enterprises receive tangible benefits before significant obligations are imposed; (3) intermediary mediation, so that a single college liaison officer or HRAU enterprise adviser manages the administrative interface, reducing enterprise transaction costs; and (4) fiscal immediacy, so that subsidy and tax benefits are accessible without complex claims procedures. The Tier 1 Observer Partner level is explicitly designed to address the awareness and attitude barrier: nearly 39 percent of survey respondents reported limited familiarity with dual education, and observation visits — in which enterprise staff attend pilot programme showcases and skills demonstrations — are an established mechanism for building employer confidence in VET quality (Euler, 2013). By creating a low-commitment entry point, the GPP enables enterprises to build knowledge and trust before committing to full training partnership.

The GPP also responds to the geographic differentiation finding by specifying that intermediary support — the college liaison officer or HRAU enterprise adviser — is a mandatory programme element at Tier 2 and above, funded through the SDC/DEVET transition budget and progressively absorbed into the HRAU operating budget and state college coordination funding by Year 5 of implementation.

5.3 Implications for Dual VET Theory

The paper's findings have implications for the theoretical understanding of dual VET employer participation beyond the Uzbek context. The institutional complementarities framework (Hall & Soskice, 2001) has been applied primarily to explain why Coordinated Market Economies sustain dual VET while Liberal Market Economies do not. This paper suggests a more granular application: within a single country and sector, the degree of institutional development determines enterprise-level participation calculus, and governance instruments must compensate for missing institutional complements rather than assuming their existence.

In Uzbekistan's hospitality SME context, the missing complements are: a functioning employer association with VET mandate (partially present through HRAU), a regulatory framework defining enterprise obligations (partially present in the 2021 Law but incomplete), a financing mechanism compensating enterprise training costs (absent), and an intermediary infrastructure reducing coordination costs (present in Tashkent only). The GPP addresses all four deficits in a sequenced and affordable manner — making it a theoretically grounded as well as practically motivated governance instrument.

CONCLUSIONS AND POLICY RECOMMENDATIONS

This paper has provided the first systematic empirical analysis of dual VET employer participation barriers in Uzbekistan's hospitality SME sector, drawing on survey data from 215 enterprises and 48 key informant interviews. Six barrier clusters were identified — administrative complexity, productivity uncertainty, trainer capacity deficit, fiscal disincentive, regulatory ambiguity, and intermediary infrastructure gap — with significant variation by enterprise size, brand affiliation, and geographic location. Fiscal barriers and regulatory ambiguity are the dominant impediments for small enterprises; trainer capacity is the primary challenge for large branded hotels; and intermediary infrastructure deficits compound all barriers in regional cities outside Tashkent.

The Graduated Participation Pathway (GPP), proposed as a practical governance response, addresses these barriers through a structured three-tier engagement model with graduated obligations and front-loaded support. The GPP is consistent with the theoretical literature on enterprise training decision-making and adapts the institutional logic of Swiss and German dual VET governance to the transitional institutional context of Uzbekistan.

The paper draws four specific policy recommendations:

- Complete the secondary legislative framework: The Government of Uzbekistan should enact the Regulation on Dual Education and the Enterprise Training Incentive Regulation within 24 months, specifying enterprise obligations, training contract templates, and fiscal incentive mechanisms. Regulatory clarity is a prerequisite for employer confidence and cannot be substituted by financial incentives alone.
- Launch the GPP as national policy: The Ministry of Tourism Development and the Hotel and Restaurant Association of Uzbekistan should formally adopt the Graduated Participation Pathway, establishing the three-tier enterprise engagement structure, the associated subsidy and tax incentive schedule, and the intermediary support system. The GPP should be embedded in the National Hospitality Sector Skills Council's enterprise engagement mandate.
- Invest in regional intermediary infrastructure: SDC/DEVET should fund enterprise liaison officer positions in Samarkand, Bukhara, Namangan, and Fergana oblasts, co-located with regional HRAU branch



offices. These positions should transition to HRAU and state budget funding by Year 4 of the DEVET exit strategy.

- Prioritize inter-company training satellite facilities: The Tashkent inter-company training facility model should be replicated in at least three regional tourism hubs by 2027, reducing the productivity burden on individual SMEs and enabling enterprises with limited internal training capacity to participate at Tier 2 and above.

The limitations of this study include the cross-sectional nature of the survey data, which cannot capture enterprise participation decisions over time; the reliance on self-reported barrier ratings, which may be subject to social desirability or strategic framing; and the concentration of the interview sample in Tashkent. Future research should track enterprise participation trajectories longitudinally as the SDC/DEVET programme scales, examine the perspectives of apprentices on enterprise training quality, and conduct comparative analysis of employer participation barriers across other Central Asian dual VET programmes in Kyrgyzstan and Kazakhstan.

Uzbekistan's tourism sector cannot wait for the slow organic development of training enterprise culture. The GPP offers a pragmatic governance bridge — lowering the cost of initial participation, building employer confidence through visible institutional support, and creating a self-reinforcing dynamic in which enterprise engagement generates the competency evidence that motivates further investment. The dual education systems of Switzerland and Germany did not emerge spontaneously; they were constructed through deliberate governance design over generations. Uzbekistan's task is to compress that institutional development into a decade, with the comparative wisdom of those systems and the catalytic energy of its development partners as its resources.

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APPENDIX: SURVEY BARRIER ITEMS — FULL DESCRIPTIVE STATISTICS

Table A1 presents full descriptive statistics for all 18 barrier items across the total sample (n=215), including mean, standard deviation, median, and skewness. Items are ordered within clusters by descending mean significance.

Cluster	Item	Mean	SD	Median	Skew
Fiscal	No financial compensation for training costs	4.44	0.61	5	-0.82
Fiscal	No tax incentive linked to training investment	4.29	0.67	4	-0.71
Productivity	Apprentices disrupt service delivery during training	4.33	0.68	4	-0.63
Productivity	Unclear timeline to productive apprentice contribution	4.18	0.71	4	-0.58
Regulatory	Unclear what legal obligations apply to training enterprises	4.18	0.75	4	-0.55
Admin	Complexity of training contracts and legal paperwork	4.21	0.74	4	-0.60
Admin	Enterprise liability for apprentice accidents/errors	4.07	0.79	4	-0.49
Trainer	No qualified in-house trainer/mentor available	4.09	0.77	4	-0.52
Intermediary	No single contact point for setting up a placement	4.02	0.78	4	-0.44
Admin	Difficulty aligning college and enterprise timetables	3.98	0.82	4	-0.41
Regulatory	Student insurance and social security uncertainty	3.96	0.81	4	-0.39
Trainer	Difficulty releasing staff to supervise apprentices	3.92	0.84	4	-0.37
Intermediary	College coordinators do not support enterprise mentors	3.88	0.85	4	-0.35
Productivity	Risk of losing trained apprentice to competitor	3.87	0.91	4	-0.33
Regulatory	Fear of labour inspection from apprenticeship contract	3.83	0.88	4	-0.31
Trainer	Lack of pedagogical training for technical staff	3.76	0.89	4	-0.28
Fiscal	Training equipment / workspace requirements costly	3.71	0.94	4	-0.26
Intermediary	No inter-company training facility to complement enterprise	3.64	0.93	4	-0.23