Preliminary Findings: Workforce Skills and Qualification Evaluation Study

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Contents

List of Tables 3

Table of Figures 3

Executive Summary 4

Introduction 7

- Background and Rationale 7
- Purpose and Scope of the Evaluation 7
- Evaluation Objectives 7
- Research Questions 8
- How This Report is Organised 8

Theoretical Framework 10

- Why a Theoretical Framework Is Needed 10
- Theoretical Perspectives Underpinning the Evaluation 10

Methods 15

- Study Design and Evaluation Logic 15
- Data sources 15
- Mixed-method integration and how evidence is stitched across datasets 16
- Key Measures and Operationalisation 17
- Analytical Strategy 18
- Representativeness and systematic bias checks 22
- Ethical Considerations 23

Findings 24

- Employee surveys 24
- Construction and distribution of training intensity (non-WSQ benchmark) 25
- Diminishing Gains Across Outcomes: Strong skills gains, Weaker Wage Gains 26

Theory-informed results using the M1–M7 model sequence 27

Do WSQ levels build capability and convert it into workplace value? (M1–M3) 27

Does WSQ predict pay directly, and through which mechanisms? (M4 then M5–M7) 29

Interpreting the WSQ levels using the full M1–M7 sequence 31

Job factors: why workplace conditions matter for “realising” WSQ value 31

WSQ SOA accumulation outperforms non-WSQ training intensity in driving workplace outcomes 32

Qualitative triangulation of pathways from WSQ to workplace outcomes 35

Overall implication from employee perspectives 37

Employer Findings 39

Training provider interview findings: why contextualised WSQ delivery is difficult to scale 47

Synthesis of Findings by Research Questions (RQ1–RQ4) 50

Findings Summary 55

Recommendations and implications for policy and practice 1

Skills realisation: make conversion into workplace value a system default 1

Talent management coupling: move employers up the maturity curve using education plus incentives/support 2

Monitoring and evaluation implications: measure progression and value realisation, not only participation 5

Conclusion 6

Summary of study and evidence base 7

What the findings conclude about “how WSQ works” 7

Contribution to policy and practice 8

Closing statement 8

References 9

Appendix A 11

Appendix B 13

Appendix C 22

List of Tables

Table 1 Alignment of Research Questions, Theory Pathways, Measures, and Analysis Plan 22

Table 2 Distribution of WSQ training participation in sample 25

Table 3 Distribution of number of WSQ SOAs and non-WSQ training intensity 26

Table of Figures

Figure 1 Distribution of gains within WSQ training 27

Figure 2 Associations between WSQ qualification level and (M1) skill improvement, (M2) performance improvement, (M3) additional responsibility, and (M4) pay increment 28

Figure 3 Pay models (M5-M7): WSQ qualification effects on pay after accounting for skill/performance improvement and additional responsibility 30

Figure 4 WSQ SOA accumulation versus non-WSQ training intensity: associations with skill improvement, performance improvement, additional responsibility, and pay increment 33

Figure 5 Distribution of gains within WSQ training by WSQ & non-WSQ required sectors 34

Figure 6 Employer archetypes in WSQ adoption: Disengaged, performance-oriented, and talent management approaches (qualitative typology) 42

Figure 7 Employer Cluster Profiles by Sector, Firm Size, Workforce Composition, and Job Requirements 44

Figure 8 Employer Clusters by Business Strategy 45

Figure 9 Employer Clusters by People Strategy 45

Figure 10 Perceived Improvements from WSQ, Skills Gaps, and WSQ-Based Hiring Likelihood by Employer Cluster 47

Executive Summary

This report evaluates Workforce Skills Qualifications (WSQ) as a national workforce development instrument, focusing not only on whether WSQ training builds skills, but also how training value is realised at the workplace, or remains unrealised, through performance improvements, expanded responsibilities, and pay outcomes. Using a theory-informed pathways lens (Human Capital (HC), Skills Utilisation (SU), Talent Management (TM), and Signalling), the evaluation distinguishes between (i) capability formation, (ii) workplace utilisation and transfer, (iii) employer recognition through responsibility expansion, and (iv) residual credential value beyond observed workplace outcomes.

Key findings

WSQ delivers strong skill gains, but downstream returns "diminished" without workplace conversion mechanisms

Across outcomes, a consistent "diminishing gains" pattern is observed: reported improvements are most common for technical skills, lower for performance, lower still for additional responsibilities, and lowest for pay increments. This pattern indicates that WSQ often succeeds at capability building, but translation into rewards depends on workplace utilisation and recognition.

Two pathways explain most pay outcomes: Improved performance and responsibility expansion

The theory-informed model sequence comprising stepwise models M1 to M7, shows that pay gains are primarily associated with improved performance and responsibility expansion. M1 to M3 examines whether WSQ is associated with skills gains, performance improvement and additional responsibilities respectively, while M4 to M7 examine whether WSQ is associated with pay increments directly, or whether pay gains are explained through skills utilisation and talent management mechanisms.

The results show that pay gains are primarily associated with:

- Improved performance (SU pathway) - skills matter when they can be applied to improve job performance; and

- Expanded responsibilities (TM pathway) - pay gains are strongly linked to employers expanding job scope and responsibilities.

In contrast, pure HC effects (skills gains alone) are insufficient to explain pay outcomes without conversion through SU and/or TM mechanisms.

WSQ progression depth (SOA accumulation) is more consistently associated with outcomes than non-WSQ training intensity

When comparing WSQ "depth" (number of Statements of Attainment (SOAs)) to a benchmark

measure of non-WSQ training intensity, SOA accumulation shows a clearer and more consistent positive association with skills, performance, responsibility expansion, and pay. Non-WSQ training intensity is weaker and less consistent, especially for outcomes that depend on workplace recognition (i.e., responsibility and pay).

Employer orientation explains why outcomes vary across firms: three employer segments converge across qualitative and quantitative evidence

Employer interviews and Ward-linkage clustering yield a convergent three-group structure:

- Disengaged employers (30%): weak endorsement of WSQ value and low integration into HR/progression practices; higher mismatch concerns and weaker perceived improvements.

- Performance-oriented employers (46%): neutral to moderately positive on WSQ, often using training to improve operational capability but with limited coupling to progression decisions.

- Talent management employers (24%): integrate WSQ more deeply into development, deployment and progression practices and report the strongest improvements.

This segmentation helps explain learner-side findings: even where training builds skills, downstream returns depend on whether employers create utilisation opportunities and embed WSQ into progression decisions.

Contextualisation remains a system constraint—echoed by employers, not only providers

Training providers highlight a persistent standardisation–contextualisation tension, particularly for SMEs and one-off cohorts where deeper contextualisation is less economically viable. Employer interviews reinforce the same constraint: even operationally strong employers report needing to run additional in-house “top-up” training after WSQ. Together, this points to a contextualisation gap and limited flexibility in current arrangements.

What the findings mean for WSQ’s theory pathways (HC / SU / TM / signalling)

Overall, the evidence supports a predominantly SU + TM interpretation of WSQ’s downstream outcomes: skills gains are necessary but insufficient; pay outcomes arise mainly when skills are used to improve performance and/or when employers expand responsibilities. Evidence consistent with signalling is more limited and appears concentrated in specific qualification tiers where a residual pay association remains after accounting for performance and responsibility mechanisms.

Implications and recommendations (high-level)

The report’s recommendations focus on strengthening WSQ value realisation by acting on the conversion mechanisms identified in the findings:

> *Skills realisation / utilisation (SU): make conversion into workplace value a default. Embed apply-at-work mechanisms, equip supervisors as utilisation enablers, and make*

application visible through work outputs. For SMEs, provide structured, low-burden supports to make utilisation feasible.

Talent management coupling (TM): link WSQ participation to deployment and progression decisions, using education plus incentives/support.
Differentiate between:

1. *Education with minimum viable coupling for disengaged employers to reduce misalignment and trigger simple recognition actions; and*

2. *Incentives/support for implementation (for performance-oriented employers) to embed WSQ/SOA milestones into routine role, deployment and progression practices.Talent management employers should be supported to codify and scale good practice as sector exemplars.*

Deeper contextualisation through employer-anchored delivery models (beyond traditional WSQ TPs): scale workplace-anchored contextualisation without diluting standards.
Enable employer-led contextualisation models (employer–provider-led) and employer–institution partnership models where workplace learning is anchored by employers and supported by institutions for learning design and assurance. Use clear guardrails (what can flex vs must remain fixed) and curate reusable contextualised evidence packs into sector resources and role-based SOA bundles.

Monitoring: shift measurement from participation to progression and value realisation.
Track SOA accumulation bands and indicators of utilisation and recognition (application opportunities, supervisor support, role changes, and progression practices), and monitor movement across employer segments as an implementation KPI.

Bottom line

WSQ is most effective when training is substantive, applied, and recognised. The evaluation shows that WSQ can build capability, but downstream outcomes depend on whether workplaces enable skills utilisation and whether employers translate capability into expanded responsibilities and progression. Strengthening employer-side conversion mechanisms, alongside scaling employer-anchored contextualisation models, will be central to maximising WSQ's contribution to workforce development priorities.

Introduction

Background and Rationale

Singapore's workforce development strategy relies on adults being able to acquire relevant skills, apply them effectively at work, and translate capability into progression and better jobs (SkillsFuture Singapore, n.d.; Workforce Singapore, n.d.). The Workforce Skills Qualifications (WSQ) framework is a core national instrument designed to support this, from competency-based training and modular Statements of Attainment (SOAs) to stackable pathways leading to full qualifications.

However, training systems are often judged on outcomes that are not entirely within the training system's control. Skills can be developed without being fully utilised; performance can improve without being formally recognised; and pay increases can be constrained by job design, wage norms, or progression rules (Baldwin & Ford, 1988; Blume, Ford, Baldwin, & Huang, 2010; OECD/ILO, 2017). This creates a central evaluation challenge: WSQ's effectiveness cannot be assessed by training outcomes alone, its value depends on how learning is converted into workplace and career outcomes.

Purpose and Scope of the Evaluation

This evaluation was commissioned to assess WSQ's contribution to workforce development and lifelong learning, focusing on both:

Outcome effectiveness (e.g., skills gains, job performance gains, role/responsibility expansion, and pay outcomes), and

Mechanisms and conditions that explain how and when WSQ translates into these outcomes.

The scope of the evaluation therefore extends beyond "does WSQ work?" to "through what pathways does WSQ create value, and what conditions strengthen that value realisation?"

Evaluation Objectives

The study is guided by four objectives that ensure alignment from research problem to implications:

- *Establish outcomes associated with WSQ participation across skills, performance, responsibility expansion, and pay outcomes.*
- *Identify pathways of value creation, distinguishing between skills development, skills utilisation, talent development, and credential recognition effects.*
- *Test the role of depth and type of WSQ engagement, including modular SOAs versus full qualifications, and compare WSQ effects with non-WSQ training intensity.*
- *Surface enabling and constraining conditions, particularly workplace practices and sectoral/occupational contexts, to inform actionable policy and practice recommendations.*

Research Questions

RQ1. Outcomes

- What outcomes are associated with WSQ participation (skills, performance, responsibility expansion, pay)?

RQ2. Pathways and mechanisms

- Through what pathways does WSQ translate into workplace and career outcomes?

RQ3. WSQ depth, modularity, and differentiation

- How do outcomes vary by WSQ exposure (e.g., SOAs accumulation vs full qualification levels)?
- How does WSQ compare with non-WSQ job-related training intensity?

RQ4. Context and conditions

- How do sector and organisational conditions shape the translation of WSQ into performance, progression, and pay?
- What implementation and policy levers can strengthen WSQ value realisation?
- What challenges do educational institutions, employers, and learners encounter under the WSQ programme?

How This Report is Organised

This report is organised to maintain a tight nexus between the evaluation objectives, research questions (RQ1–RQ4), theoretical pathways (HC/SU/TM/signalling), the mixed-method design, and the resulting recommendations. Each chapter plays a distinct role in building the evidence and translating it into policy and practice implications.

Theoretical Framework. This chapter establishes the evaluation logic used throughout the report. It introduces the pathways lens, Human Capital (skills formation), Skills Utilisation/transfer (conversion into performance), Talent Management (role and responsibility expansion), and Signalling/credential recognition (residual credential value), and explains why WSQ outcomes should be interpreted as a conversion chain (skills → performance → responsibility → pay), rather than as a single outcome effect.

Methods. This chapter documents how the evidence base was constructed and why the mixed-method design is appropriate for answering the research questions. It describes the study design and evaluation logic, the data sources (employee survey, employer survey, and interviews with employees, employers, and training providers), key measures and operationalisation (WSQ engagement via SOA accumulation and qualification tier; outcomes mapped to the pathway logic), and the analytical strategy. It also explains how findings are triangulated across datasets and why integration is conducted through mechanism-based triangulation rather than employee–employer matched-pair inference.

Findings. This chapter presents the quantitative and qualitative results in a sequence aligned to the research questions and pathway logic. It begins with employee survey descriptives on WSQ participation patterns (full qualifications and SOA accumulation) and the construction/distribution of the non-WSQ training intensity benchmark. It then documents the "diminishing gains" pattern across outcomes (skills, performance, responsibility expansion, and pay) to motivate the mechanism-focused analysis. Next, it reports the theory-informed M1–M7 model sequence to answer how WSQ builds capability and how value is (or is not) converted into downstream outcomes. The chapter then examines job factors and sector context to explain why workplace conditions shape value realisation and compares SOA accumulation with non-WSQ training intensity. Finally, it triangulates the learner-side findings with evidence from employee interviews, employer findings (survey clustering and interviews), and training provider interviews, including the standardisation–customisation constraints that affect contextualisation at scale.

Recommendations and implications for policy and practice. This chapter translates the integrated evidence into actionable recommendations mapped directly to the conversion levers identified in the findings. Recommendations focus on strengthening skills utilisation (post-training application), strengthening talent management integration (linking WSQ/SOA progression to job scope and progression decisions), enabling contextualisation at scale (especially for SMEs), adopting a differentiated employer engagement strategy informed by the employer segments, and improving monitoring and evaluation metrics to track value realisation rather than participation alone.

Conclusion. The concluding chapter summarises the study and evidence base, states what the findings imply about "how WSQ works" through the HC/SU/TM/signalling pathways and highlights the contribution to policy and practice. It also documents study limitations and interpretation notes, proposes next steps for future evaluation cycles, and closes with an overall statement on WSQ value realisation.

Theoretical Framework

Why a Theoretical Framework Is Needed

WSQ is intended to strengthen workforce capability and support progression in the labour market. However, wage and progression outcomes are shaped not only by training participation, but also by whether skills are used in jobs, recognised by employers, and rewarded through role and pay systems (Baldwin & Ford, 1988; OECD/ILO, 2017). Evaluations that focus only on "whether outcomes improved" can therefore miss the more policy-relevant question: how WSQ creates value, and where that value is blocked from being realised.

To interpret WSQ outcomes accurately, and to ensure that implications and recommendations target the right levers, this evaluation adopts a pathways framework grounded in four established perspectives:

1. *Human Capital (HC): WSQ builds capability (skills formation).*
2. *Skills Utilisation / Transfer (SU): capability is converted into improved performance when the work environment supports application.*
3. *Talent Management (TM): performance and capability translate into expanded responsibilities, progression, and job scope through employer decisions.*
4. *Signalling / Credential Recognition: WSQ credentials may carry labour-market value beyond observed changes in skills, performance, or responsibilities.*

This pathways lens clarifies that WSQ can "work" through multiple mechanisms, and that weak pay effects do not necessarily mean weak programme value, they may indicate constraints in utilisation, job scope, or recognition.

Theoretical Perspectives Underpinning the Evaluation

Human Capital

Human capital theory frames training as an investment that raises individuals' productive capacity through improved knowledge and job-relevant skills (Becker, 1964). Within the WSQ context, this perspective implies that deeper engagement, through accumulating more SOAs or completing higher WSQ qualification tiers, should be associated with stronger reported skills gains and, potentially, better work performance. When this pattern is observed, it supports a policy interpretation that WSQ is functioning effectively as a skills formation system: it is building capability that is relevant to work and improving individuals' readiness to perform.

At the same time, prior evidence cautions that skills gains are often the most proximal outcome of training and may not automatically translate into downstream outcomes such as performance,

progression, or pay unless workplace conversion conditions are present (Baldwin & Ford, 1988; Blume, Ford, Baldwin, & Huang, 2010). This motivates examining not only whether WSQ builds skills, but whether those skills are subsequently used and recognised.

While Human Capital Theory suggests that WSQ training may improve workers' skills and productivity, the relationship between WSQ attainment and pay is unlikely to operate through credential acquisition alone. Pay increments may occur when training improves workers' productivity, when improved capability is utilised in the workplace, or when employers expand workers' roles and responsibilities. From a skills utilisation perspective, training is more likely to translate into pay when workers are able to apply newly acquired skills to improve job performance. From a talent management perspective, pay gains may also arise when employers recognise WSQ-related capability through expanded job scope, additional responsibilities or progression within internal labour markets. At the same time, WSQ credentials may carry signalling value if employers reward the qualification itself as evidence of recognised competence.

Accordingly, this evaluation examines whether WSQ engagement is associated not only with skills gains, but also with performance improvement, responsibility expansion and pay increments. These outcomes are treated as linked but distinct stages in the conversion of training into workplace and labour market returns.

Skills Utilisation and Transfer of Training

Skills utilisation and transfer-of-training perspectives complement human capital theory by explaining why capability gains may not translate automatically into workplace impact. Classic transfer models emphasise that transfer depends on a combination of trainee factors, training design and, critically, the work environment (Baldwin & Ford, 1988). Across reviews and meta-analyses, the work environment repeatedly emerges as a major determinant of transfer, highlighting factors such as supervisor and peer support, feedback and coaching, opportunities to perform, and a "transfer climate" that encourages application (Blume, Ford, Baldwin, & Huang, 2010; Burke & Hutchins, 2007; Rouiller & Goldstein, 1993).

In the WSQ evaluation, this perspective underpins the expectation that skills gains should be associated with performance gains when workers can apply what they learned. Where skills gains are evident, but performance outcomes remain limited, the interpretation is not necessarily that WSQ is ineffective; rather, it signals a capability–application (conversion) gap shaped by workplace conditions. This is especially relevant where new skills require time, repetition, experimentation, or changes to established routines (Grossman & Salas, 2011).

Talent Management

A talent management perspective highlights that organisations do not reward skills in the abstract; instead, they allocate roles, responsibilities, and progression opportunities through internal labour market structures and organisational decision-making (Collings & Mellahi, 2009; Cappelli, 2008).

From this viewpoint, WSQ may generate value when employers incorporate WSQ participation and demonstrated capability into staffing and progression decisions, such as assigning broader responsibilities, expanding job scope, re-grading positions, or enabling internal mobility.

This lens is policy-relevant because evidence across workforce studies suggests that pay growth often depends on whether capability is "cashed out" through role expansion and progression mechanisms, not merely through individual improvement (McCue, 1996; Baker & Holmstrom, 1995; Baker, Gibbs, & Holmstrom, 1994). In this evaluation, responsibility expansion is treated as a practical indicator of such talent management mechanisms: if WSQ engagement is associated with increased responsibilities, and responsibility expansion is in turn associated with pay gains, this suggests that WSQ's value is being realised through progression and role architecture rather than training alone.

Signalling and credential recognition

Signalling theory offers a distinct explanation by focusing on the labour-market value of credentials as indicators of capability, trainability, or occupational readiness under imperfect information (Spence, 1973). Under this view, WSQ qualifications may influence pay and progression not only through measured improvements in skills or performance, but also because the credential itself is valued and recognised in hiring, wage-setting, or progression decisions.

In this evaluation, the signalling mechanism is examined by assessing whether WSQ qualification tiers predict pay outcomes even after accounting for intermediate outcomes such as skills gains, performance gains, and responsibility expansion. Where such "residual credential effects" are observed, they are interpreted as evidence consistent with credential recognition operating beyond what is captured in observed or self-reported workplace changes. Importantly, prior evidence suggests that credential effects are often context-shaped: they tend to be stronger where credentials are embedded in institutional norms or HR practices and weaker where rewards are based mainly on role scope and measured performance (Brown & Souto-Otero, 2020; Spence, 1973).

What prior evidence suggests and how it motivates the WSQ pathways design

Across the training and workforce development literature, a consistent conclusion is that training outcomes do not "auto-convert" into workplace returns. Human capital perspectives explain why training can build capability (skills and knowledge), but transfer and skills utilisation research shows that whether capability becomes improved performance depends heavily on post-training conditions, especially supervisory support, opportunities to apply new skills, and an enabling transfer climate. In parallel, talent management and internal labour market perspectives emphasise that many labour-market returns are mediated through organisational decisions: how jobs are designed, whether responsibilities expand, and whether progression systems recognise new capability. Finally, credential recognition and signalling perspectives suggest that some qualifications may carry residual value as broadly understood indicators of readiness or trainability, but that such effects are likely to vary by sector norms and how credentials are used in hiring and progression.

Taken together, prior evidence implies that WSQ can generate value through more than one route, and that weak results at the "end outcomes" stage do not necessarily indicate weak training content. Instead, weak downstream outcomes often reflect a break in the conversion chain, where skills gains are not sufficiently utilised, recognised, or translated into expanded roles and rewards. This is particularly relevant in heterogeneous workplace settings: where job scope is narrow, workflow constraints are high, or supervisors do not create opportunities for application, performance gains may not follow even when skills improve. Conversely, where employers embed training into job redesign and progression decisions, returns may appear as responsibility expansion and pay progression rather than as skills gains alone.

Accordingly, this evaluation adopts an integrated pathways lens to interpret WSQ outcomes. Human capital (HC) is treated as the capability-formation pathway (skills gains). Skills utilisation and transfer (SU) represent the translation pathway (skills applied to improve performance). Talent management (TM) represents the organisational recognition pathway (expanded responsibilities and progression decisions). Signalling/credential recognition captures the possibility of residual credential value beyond observed workplace mechanisms. This integrated lens is policy-relevant because it clarifies that WSQ "working" can manifest in different ways: success may appear as skills gains, performance improvements through application, role expansion through employer decisions, or credential recognition effects, each implying different levers for policy and practice.

Analytical Approach: Translating Theory into Testable Evidence

What this evaluation adds is a mechanism-based test of this conversion chain rather than an outcomes-only assessment. Instead of treating skills, performance, responsibility expansion, and pay as parallel endpoints, the analytical design sequences them as linked stages. This allows the evaluation to distinguish (i) whether WSQ is associated with skills gains (HC), (ii) whether skills gains translate into improved performance under workplace conditions (SU), (iii) whether improved performance is accompanied by expanded responsibilities through employer decisions (TM), and (iv) whether any direct pay effects remain after accounting for these workplace mechanisms (consistent with residual credential recognition). The result is a tighter nexus between theory, research questions, and evidence: the models are designed to investigate where along the chain value is strengthened or thins out, and therefore which interventions are most relevant.

Implications for Interpreting Results

This framework supports policy-relevant interpretation by distinguishing between programme effectiveness and the broader conditions required for value realisation. Where WSQ engagement is strongly associated with skills gains but shows weaker associations with pay outcomes, this is interpreted as evidence that WSQ is achieving its training function while the conversion of skills into rewards may be constrained by utilisation conditions or progression structures. Where pay outcomes are observed primarily when performance improves, the results indicate that labour-market returns depend on skills being applied and recognised through performance-linked mechanisms. Where pay

outcomes are observed primarily when responsibilities expand, the results suggest that WSQ value is realised through job scope and progression systems, consistent with talent management mechanisms. Finally, where specific WSQ qualification tiers predict pay after accounting for skills, performance, and responsibility measures, this points to credential recognition effects and reinforces the importance of employer and sector alignment and the portability of WSQ credentials.

In summary, this chapter provides a theory-informed basis for interpreting WSQ outcomes through a pathway lens. By combining human capital, skills utilisation, talent management, and signalling perspectives, the evaluation can identify whether WSQ primarily builds capability, enables performance through workplace application, supports progression through employer decisions, and/or generates labour-market value through credential recognition. This framework anchors the measures and model sequencing in the next chapter and provides a consistent basis for linking evidence to actionable policy and practice recommendations in the concluding chapters.

Methods

Study Design and Evaluation Logic

This evaluation uses a mixed-methods design to (i) quantify the association between WSQ engagement and key outcomes, and (ii) explain the mechanisms and conditions that enable (or constrain) WSQ value realisation. The analysis is explicitly structured to test the theory-informed pathways set out in the previous chapter.

Data sources

WSQ Employee Survey (n = 888; plus non-WSQ comparison n = 112)

A structured online survey capturing learner background, WSQ engagement and self-reported outcomes (skills, performance, responsibility expansion, pay). Past WSQ leaners were recruited through training providers identified by SkillsFuture Singapore (SSG). SSG contacted these providers, who subsequently distributed survey invitations to their past learners. As the number of invitations sent was not tracked, an overall response rate cannot be computed.

Non-WSQ employees were recruited through two channels: (1) re-contacting previous IAL survey respondents who had provided consent to be approached for future research, and (2) convenience sampling. Eligibility was restricted to individuals who had not participated in any WSQ training, but who had undertaken some form of work-related training within the last 12 months.

WSQ Employer Survey (n = 50)

A survey capturing organisational use of WSQ and how WSQ is positioned within business and people strategies. This dataset supports employer segmentation (archetypes) for targeted policy implications.

Employee Interviews (n = 10)

To deepen interpretation of survey patterns, 10 WSQ participants were selected for in-depth interviews using purposive sampling to achieve diversity across occupation, sector, and WSQ experience. Interviews explored motivations for undertaking WSQ, perceived relevance and applicability of training, opportunities to apply learning at work, and how WSQ influenced performance, progression and pay in practice. Each interview lasted approximately 45–60 minutes, was conducted online via Zoom, and was transcribed for analysis.

Employer Interviews (n = 10)

To clarify the organisational mechanisms behind value realisation, 10 employers were interviewed. These interviews focused on how WSQ is positioned within business and people strategies; how training is translated into productivity and role redesign; how WSQ credentials are used (or not used)

in hiring and progression; and what constraints limit stronger returns (e.g., limited internal progression ladders, wage norms, operational requirements, or business model constraints). These insights directly inform the interpretation of Talent Management and Skills Utilisation pathways identified in the quantitative analysis.

Training Provider Interviews (n = 4)

To incorporate an implementation and delivery perspective, four training providers were interviewed. Provider interviews focused on programme design and contextualisation practices, employer engagement models, learner profile considerations, and perceived constraints affecting transfer and recognition (e.g., employer readiness, job fit, sector requirements). These interviews support policy-relevant recommendations on where WSQ design, delivery and employer interface can be strengthened.

Mixed-method integration and how evidence is stitched across datasets

This evaluation uses a mixed-methods design to test both outcomes and the mechanisms that convert training into workplace returns. The quantitative and qualitative components are designed to be complementary: survey data establish the distribution and strength of associations along the outcomes chain, while interviews explain how and why conversion succeeds or breaks in different workplace contexts. Integration occurs at three levels.

First, the datasets are aligned to a common pathways model. The employee survey captures key stages of the conversion chain, skills gains, performance improvements, responsibility expansion, and pay outcomes, allowing the analysis to test whether WSQ qualifications are associated with each stage and whether downstream outcomes remain once earlier stages are accounted for. The employer survey captures workplace practices and orientations that theory predicts will enable conversion (e.g., how training is recognised, whether progression and job scope respond to skills, and whether WSQ is embedded in HR and development practices). Interview transcripts were analysed using thematic analysis tailored to each stakeholder group. Employee interviews (n=10) were coded inductively to identify emergent themes around training experiences, workplace application, and progression outcomes, then recoded using the HC/SU/TM framework to map patterns onto the evaluation's pathway logic. Employer interviews (n=10) were analysed with the HC/SU/TM framework in mind from the outset, focusing on why and how employers use WSQ and what conditions enable or constrain value realisation. Patterns in how employers recognised skills, linked training to job scope and progression, and embedded WSQ into HR and development practices were then synthesised into a set of employer archetypes, used to structure interpretation of the survey results and to inform differentiated implications by employer orientation. Training provider interviews (n=4) were used to identify system-level constraints affecting contextualisation and delivery. Together, the interviews with employees, employers, and training providers provide explanatory evidence on the organisational conditions that shape utilisation (opportunities to apply

learning, support and feedback, workflow constraints) and on system constraints affecting contextualisation and uptake (especially for SMEs).

Second, integration is achieved through triangulation by theme and mechanism rather than by attempting to merge all datasets at the individual unit level. For example, quantitative patterns indicating that outcomes "thin out" downstream are interpreted alongside interview accounts of limited opportunities to apply learning, narrow job scope, or weak recognition practices. These mechanisms were first surfaced inductively from the interviews and then aligned to HC/SU/TM stages to support mechanism-based triangulation with the survey results. Similarly, employer segmentation patterns (from survey-based clustering and interview typologies) are used to interpret why similar training experiences yield different downstream outcomes. Where employers embed WSQ into job design and progression decisions, responsibility expansion and pay progression are more plausible; where employers treat WSQ as compliance or do not translate skills into role expansion, outcomes are more likely to stall at the skills stage. These archetypes, derived from analysing employer interviews through the lens of why and how WSQ is used, which converge with the survey-based clustering to produce a coherent three-segment framework.

Third, integration is reflected in the reporting structure: quantitative findings present the magnitude and sequencing of associations by outcome stage, and qualitative findings are organised to explain the key "break points" in the chain (skills formation → utilisation → recognition). This structure allows the evaluation to establish not only whether outcomes occur, but how and why conversion succeeds or fails at specific stages. By organising evidence around mechanisms rather than isolated outcomes, the report enables systematic triangulation across both quantitative and qualitative datasets to check whether different sources converge on the same explanatory story. This convergent evidence approach is particularly well-suited to identifying mechanisms in multi-stakeholder systems where individual-level linkage is not feasible.

Key Measures and Operationalisation

WSQ participation (main explanatory variables)

To reflect WSQ's modular and stackable design, WSQ participation is operationalised through:

- SOA accumulation (How many SOAs did you obtain?), and
- WSQ qualification tier (What full WSQ levels do you have? E.g. WSQ Certificate, Higher Certificate, Advanced Certificate, Diploma, Specialist/Graduate Diploma).

Where relevant, the analysis distinguishes SOA-only progression from full qualification attainment, and incorporates non-WSQ training intensity as a comparator to clarify whether observed patterns are specific to WSQ's structured progression rather than training volume alone.

Outcomes mapped to the theoretical framework

The employee survey captures four outcome domains aligned to the study's theoretical framework:

Skills gains (HC)

The technical skills outcome is coded as 1 = "Improve" and 0 = "No change" or "Decline" based on the item: "Have you observed any changes in your technical skills related to WSQ training since completion?"

Performance gains (SU/transfer)

Performance improvement is coded as 1 = "Quite a lot" or "A great deal" and 0 = "Not at all" or "A little" or "To some extent" based on the item: "To what extent has WSQ training improved your performance in your current job role?". The cut-off is chosen to reflect a threshold of meaningful workplace application rather than minor or uncertain change.

Responsibility expansion (TM)

Additional responsibility is coded as 1 = "Quite a lot" or "A great deal" and 0 = "Not at all" or "A little" or "To some extent" based on: "To what extent has WSQ training contributed to you taking on any additional responsibilities?". This operationalisation aligns with the interpretation of responsibility expansion as an indicator of role scope change that is likely to require employer recognition or job redesign.

Pay increment (downstream outcome through SU/TM and/or signalling)

Pay increment is coded as 1 = "Quite a lot" or "A great deal" and 0 = "Not at all" or "A little" or "To some extent" based on: "To what extent has WSQ training contributed to a pay increment in your current job role?". This threshold helps distinguish respondents who attribute a clear wage-related change to WSQ from those reporting minimal or no pay effect.

Using a stricter cut-off (1 = "Quite a lot"/ "A great deal"; 0 = "Not at all"–"To some extent") does not change the main pathway conclusions, though effect sizes vary with the stricter outcome definition.

Job Factors

In addition to the core constructs of WSQ participation and outcomes, the survey collected data on job factors which examine job content and job context.

Analytical Strategy

The analysis proceeds in three linked parts: (A) descriptive profiling, (B) theory-informed modelling (M1–M7), and (C) employer archetypes + qualitative triangulation.

Descriptive analysis (context-setting)

Descriptive statistics and cross-tabulations summarise: sample composition, WSQ engagement patterns (SOAs and qualification tier), distributions of outcomes (skills, performance, responsibilities, pay), and perceptions of credential value. These establish baseline patterns and inform interpretation of modelling results.

Theory-informed modelling (employee survey): the M1–M7 sequence

To maximise interpretability and alignment with the theoretical framework, regression modelling is organised as a mechanism-testing sequence rather than isolated models. Logistic regression is used for binary outcomes (reporting improvement vs not), with controls to reduce confounding from observable differences.

Controls (applied consistently across models): demographic characteristics and job-related factors (e.g., occupation/industry and other relevant covariates available in the dataset). This ensures comparisons across WSQ levels are not driven purely by compositional differences.

I. Models testing HC, SU and TM mechanisms (intermediate outcomes)

- M1 (Human Capital test): Tests whether higher levels of WSQ engagement are positively associated with reported skills gains (outcome)
  Interpretation: evidence consistent with WSQ as skills formation.

  H_{null}: WSQ engagement is not significantly associated with reported skills gains

  $H_{alternate}$: Higher levels of WSQ engagement are significantly associated with reported skills gains

- M2 (Skills Utilisation test): Test whether higher levels of WSQ engagement are positively associated with reported performance gains (outcome)
  Interpretation: evidence consistent with WSQ translating into workplace performance.

  H_{null}: WSQ engagement is not significantly associated with reported performance gains.

  $H_{alternate}$: Higher levels of WSQ engagement are positively associated with reported performance gains.

- M3 (Talent Management test): Tests whether higher levels of WSQ engagement are positively associated with reported responsibility expansion (outcome)
  Interpretation: evidence consistent with role expansion/progression processes linked to WSQ.

$H_{null:}$ WSQ engagement is not significantly associated with reported responsibility expansion.
$H_{alternate:}$ Higher levels of WSQ engagement are positively associated with reported responsibility expansion.

II. Pay models testing "conversion" and signalling

The pay models are specified to examine whether the association between WSQ engagement and reported pay increments operates directly or is accounted for by intermediate workplace outcomes. M4 first estimates the baseline association between WSQ engagement and reported pay increments, before accounting for skills gains, performance improvement or responsibility expansion. M5 then adds reported skills and performance gains, while M6 adds responsibility expansion. M7 includes skills gains, performance gains and responsibility expansion together.

This stepwise approach allows the analysis to assess whether the WSQ-pay association remains after accounting for these intermediate outcomes. If the association between WSQ engagement and pay weakens after performance improvement or responsibility expansion is included, this suggests that pay gains may be partly associated with skills utilisation or role expansion. If the association remains even after these factors are included, this would be consistent with a residual credential-signalling or recognition effect. The models should be interpreted as mechanism-focused association models rather than formal causal mediation tests.

- M4 (Pay baseline): Tests higher levels of WSQ engagement are positively associated with reported pay increment (outcome)
  Interpretation: establishes whether pay outcomes are associated with WSQ exposure before testing mechanisms.

  $H_{null:}$ WSQ engagement is not significantly associated with reported pay increments.
  $H_{alternate:}$ Higher levels of WSQ engagement are positively associated with reported pay increments.

- M5 (HC/SU-adjusted pay): Tests whether higher levels of WSQ engagement remain positively associated with reported pay increments after accounting for reported skills gains and performance gains.
  Interpretation: tests whether any WSQ–pay association is explained by skill improvements (HC) and performance (SU).

  $H_{null:}$ Reported skills gains and performance gains do not significantly account for the association between WSQ engagement and pay increments.
  $H_{alternate:}$ Reported performance gains, and where relevant skills gains, significantly account for the positive association between WSQ engagement and pay increments.

- M6 (TM-adjusted pay—partial conversion): Tests whether higher levels of WSQ engagement remain positively associated with reported pay increments after accounting for reported responsibility expansion.
  Interpretation: tests whether the association between WSQ and pay increment is partly explained by expanded role scope.

  H_{null}: Reported responsibility expansion does not significantly account for the association between WSQ engagement and pay increments.
  $H_{alternate:}$ Reported responsibility expansion significantly accounts for the positive association between WSQ engagement and pay increments.

- M7 (Fully adjusted pay / signalling test): Tests whether higher levels of WSQ engagement remain positively associated with reported pay increments after accounting for reported skills gains, performance gains and responsibility expansion.
  Interpretation: if WSQ qualification tier still predicts pay after accounting for these intermediates, this is interpreted as evidence consistent with signalling/credential recognition. If the WSQ effect attenuates, the interpretation is that pay returns are realised primarily through conversion mechanisms (SU and/or TM) rather than direct credential effects.

  H_{null}: After accounting for reported skills gains, performance gains and responsibility expansion, WSQ engagement is not significantly associated with reported pay increments.
  $H_{alternate:}$ After accounting for reported skills gains, performance gains and responsibility expansion, WSQ engagement remains significantly associated positively with reported pay increments.

Why this sequence matters for policy interpretation:
It allows the evaluation to distinguish whether WSQ's labour-market value is mainly realised through (a) building skills (HC), (b) enabling performance via utilisation (SU), (c) supporting progression via role expansion (TM), or (d) credential recognition beyond measured outcomes (signalling).

Employer segmentation and archetypes (employer survey)

Employer survey responses (n=50) are analysed to develop employer archetypes based on:

- how WSQ is used (training and HR processes),
- why WSQ is used (capability building vs compliance vs progression), and
- how WSQ is valued relative to academic qualifications (recognition/credibility).

A clustering approach is applied to segment employers into interpretable groups that can support targeted recommendations (e.g., minimal engagement; performance-oriented but not systematised;

integrated progression users). An exploratory hierarchical clustering approach with Ward's linkage. The clustering was based on selected indicators relating to how employers use WSQ, how they value WSQ, and whether WSQ is integrated into training, deployment and progression practices.

Qualitative analysis and triangulation (employees, employers, providers)

Interview transcripts are analysed thematically. Employee interviews used inductive coding to identify emergent themes, which were then mapped onto the HC/SU/TM framework. Employer interviews applied the HC/SU/TM framework deductively to identify distinct usage patterns, generating employer archetypes based on how firms engaged with and integrated WSQ into their own HR practices. Training provider interviews focused on system-level constraints. Across stakeholder groups, the analysis identified the following themes:

- utilisation and transfer conditions (opportunity to perform, supervisor support, workflow fit),
- progression and role architecture mechanisms (how responsibility expansion decisions are made), and
- credential recognition dynamics (where and why WSQ is treated as a credible signal).

Qualitative evidence is used to explain quantitative patterns (especially "conversion gaps") and to translate findings into implementable levers by employer type and context.

Table 1 Alignment of Research Questions, Theory Pathways, Measures, and Analysis Plan

Research Question	Primary theory route(s)	Key measures	Analysis / evidence used	Interpretation lens (what we expect to learn)
RQ1 Outcomes	HC, SU, TM	Skills, performance, responsibility, pay	Descriptives + M1–M4	Whether outcomes show a staged pattern across capability → application → progression → pay
RQ2 Pathways	HC→SU; TM; signalling	Performance, responsibility; residual pay	M1–M7 sequence, supported by qual triangulation	Whether pay effects are indirect (via SU/TM) vs residual credential effects (signalling)
RQ3 Depth/ modularity	Dose–response (HC/SU/TM)	SOA bands; non-WSQ intensity	SOA vs non-WSQ comparisons + regressions, supported by qual triangulation	Whether WSQ depth/progression predicts outcomes more consistently than general training exposure
RQ4 Conditions	Transfer climate; job design; sector norms	Job factors; employer archetypes; TP constraints	Job factors + employer/provider qual	Which workplace/provider conditions enable or constrain conversion of training into outcomes

Representativeness and systematic bias checks

This evaluation is designed to explain how WSQ value is realised through workplace mechanisms, rather than to produce population-level impact estimates with known response rates. The learner survey sample was recruited through training channels and benchmarked with a non-WSQ training

comparator group. As the full sampling frame and response rate were not available, representativeness should be interpreted in terms of coverage of relevant WSQ learner profiles and the consistency of mechanism patterns across subgroups, rather than strict population inference.

To support transparent interpretation, we conducted and/or considered the following systematic bias checks using available data:

1. **Profile coverage check (who is in the sample).**
   We summarise the sample composition (e.g., demographics, sector/occupation where available, qualification tier) to provide visibility on who the findings best represent (see Appendix A). The purpose is not to claim statistical representativeness, but to confirm that the sample covers a meaningful spread of WSQ learner types and progression depths.

2. **Outcome threshold robustness (stringent vs inclusive definitions).**
   Key outcome measures were operationalised using a stringent "high improvement" cut-off (e.g., "quite a lot/a great deal") to reduce noise from marginal changes and social desirability. We interpret results in conjunction with qualitative evidence to mitigate the risk that self-reports overstate effects uniformly. Where conclusions rely on patterns across multiple outcomes (skills → performance → responsibility → pay), the sequential evidence reduces reliance on any single indicator.

3. **Employer evidence generalisability.**
   Employer survey results are interpreted with caution given sample size, and are treated as directional. Confidence is strengthened through triangulation: employer interviews, training provider interviews, and consistency with learner-side pathways. The employer clustering results are therefore used primarily as an implementation lens (differentiated strategies), rather than as definitive estimates of national employer proportions.

Overall, these checks support a balanced interpretation: the findings provide credible evidence of plausible pathways and enabling conditions (SU and TM conversion mechanisms), while avoiding over-claims about population-wide effect sizes.

Ethical Considerations

The study received ethics approval from the SUSS IRB. Participation was voluntary with informed consent. Data were anonymised and reported in aggregate to protect confidentiality.

Findings

Employee surveys

Participation in WSQ

This section begins by describing how respondents in the employee survey are distributed across WSQ participation types, as this is central to interpreting outcomes. Within the sample, WSQ participation spans both full qualifications and modular attainment through Statements of Attainment (SOAs). Table 2 summarises respondents' highest WSQ attainment (n = 888). The sample reflects a mixed progression profile, with a substantial proportion participating at the modular SOA stage as well as a sizeable share completing full qualifications.

For the purpose of analysis, WSQ participation is grouped to reflect the distinction between modular SOA-based participation and full qualification attainment. As a WSQ full qualification minimally comprises several SOAs, respondents who did not report attaining a full qualification were grouped into two levels of non-full-qualification attainment: 1-2 SOAs and 3-4 SOAs.

The 1-2 SOA group represents lower-intensity modular participation and is used as the reference group in the subsequent analysis. The 3-4 SOA group represents a higher level of modular progression but remains below the threshold typically associated with attaining a full WSQ qualification. Respondents who reported attaining a full WSQ qualification are classified separately by their highest reported qualification level. Where respondents reported both a full WSQ qualification and fewer than five SOAs, the full qualification response was prioritised during data cleaning, as full qualifications would typically comprise five or more SOAs. This is because respondents are likely to recall whether they completed a full WSQ qualification more reliably than the exact number of SOAs attained, especially where SOAs were accumulated over time or embedded within a qualification pathway.

This grouping allows the analysis to compare lower-intensity modular WSQ participation, more substantive modular progression, and full qualification pathways in a consistent manner across the descriptive tables, figures and regression models.

As shown in Table 2, 31.6% of respondents reported attaining 1–2 SOAs, while 8.6% reported attaining 3–4 SOAs without a full qualification. This indicates that around four in ten respondents engaged with WSQ through modular SOA-based participation.

Full WSQ qualifications account for 59.8% of the sample and are concentrated in the mid-tiers. WSQ Diploma is the largest full-qualification group (18.9%), followed by WSQ Advanced Certificate (13.5%) and WSQ Certificate (10.8%). WSQ Higher Certificate constitutes 73 respondents (8.2%), while WSQ Specialist & Graduate Diploma, the highest tier in this breakdown, accounts for 74

respondents (8.3%). This distribution provides a robust basis for examining how outcomes vary by both credential tier and modular progression.

Table 2 Distribution of WSQ training participation in sample

WSQ FQ	Freq.	%
1-2 SOAs	281	31.6
3-4 SOAs	76	8.6
WSQ Certificate	96	10.8
WSQ Higher Certificate	73	8.2
WSQ Advanced Certificate	120	13.5
WSQ diploma	168	18.9
WSQ Specialist & Graduate Diploma	74	8.3
Total	888	100

To assess whether outcomes vary by depth of WSQ participation, respondents were grouped by the total number of SOAs attained (see Table 3 below). The distribution is skewed toward lower SOA accumulation, consistent with WSQ's modular design. 1 SOA remains the largest category (33.1%), followed by 2 SOAs (12.5%) and 3–4 SOAs (11.2%). Importantly, a meaningful share demonstrates deeper progression beyond the initial SOA levels: 5–7 SOAs (13.2%), 8–10 SOAs (9.2%), and more than 10 SOAs (9.6%).

Construction and distribution of training intensity (non-WSQ benchmark)

To provide a benchmark for general training exposure (beyond WSQ depth), the study constructs a training intensity measure from the survey question asking respondents, on average, how many days of training they undertake per year. Training intensity is operationalised as:

Training intensity = Average training hours reported per year ÷ Total years of work experience

This normalisation is intended to reduce distortion from seniority (as workers with longer careers tend to accumulate more total training) and to enable a clearer comparison between structured WSQ progression (SOAs) and general training "dose".

Training intensity was computed for non-WSQ respondents with valid training-hours responses; one case was excluded due to an invalid training-hours entry (valid WSQ learners n= 888, non-WSQ learners, 111, total valid n= 999).

Based on the distribution, respondents were classified into four bands: very low, low, moderate, and high training intensity. These bands are small in size (very low: 28; 2.8%; low: 28; 2.8%; moderate: 30; 3.0%; high: 25; 2.5%) and are therefore treated primarily as a contextual benchmark rather than the main indicator of learning progression.

It is important to note that Table 3 uses a different classification approach from Table 2. Table 2 classifies respondents by their highest reported WSQ attainment, where respondents who reported a full WSQ qualification are classified by their highest qualification level. By contrast, Table 3 groups

respondents by their reported number of SOAs attained, as this variable is used to examine WSQ progression depth and to compare it with non-WSQ training intensity.

As a result, the 1-2 SOA and 3-4 SOA groups in Table 3 should not be read as identical to the SOA-only groups in Table 2. Table 2 reflects cleaned highest attainment, while Table 3 reflects reported SOA accumulation for the purpose of analysing training depth. The 1-2 SOA group is retained as the reference category in the subsequent analysis, while the 3-4 SOA group captures a higher level of modular progression before deeper SOA accumulation.

Table 3 Distribution of number of WSQ SOAs and non-WSQ training intensity

Number of WSQ SOAs and non-WSQ training intensity	Freq.	%
1-2 SOAs	456	45.6
3- 4 SOAs	112	11.2
5- 7 SOAs	132	13.2
8- 10 SOAs	92	9.2
>10 SOAs	96	9.61
Very low intensity	28	2.8
Low intensity	28	2.8
Moderate intensity	30	3.0
High intensity	25	2.5
Total	999	100

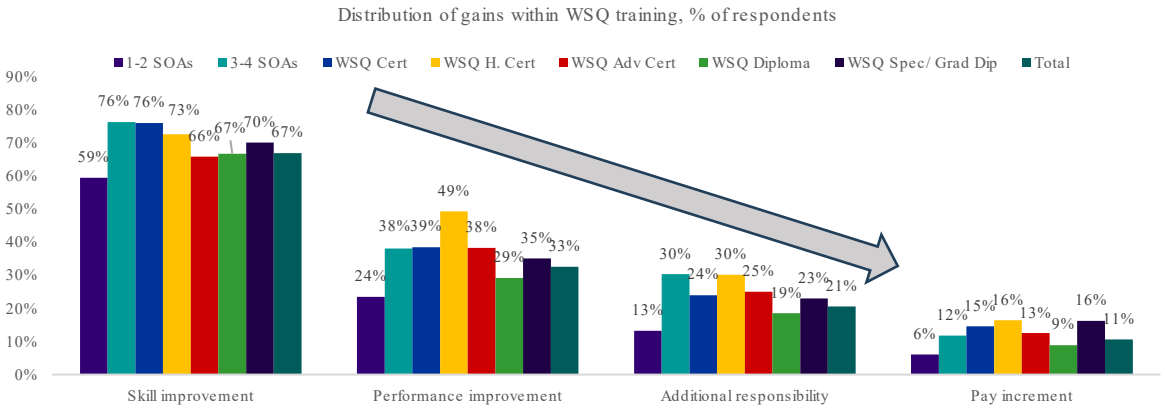
Note: Total survey n= 1,000. Training intensity was computed only for respondents with valid training-hours data; one non-WSQ respondent provided a non-valid/non-usable training-hours response and was excluded from the training-intensity calculations (valid n= 999).

Diminishing Gains Across Outcomes: Strong skills gains, Weaker Wage Gains

Across the four outcome domains measured, skills, performance, responsibility expansion, and pay, respondents exhibit a clear “diminishing” pattern consistent with a conversion model (see Figure 1). Reported skills gains are most prevalent: 67% of respondents reported improvement in technical skills after WSQ training. Reported performance gains are lower and more variable depending on how they are measured: when asked on an extent scale, only 33% indicated WSQ improved their performance “quite a lot” or “a great extent”.

Reported responsibility expansion sits below skills and performance: 21% of the respondents indicated WSQ helped them take on additional responsibilities “quite a lot” or “a great extent”. Finally, reported pay increments are the least prevalent: 11% indicated they received a pay increment attributable to WSQ. Taken together, these results indicate that while WSQ is commonly perceived as effective for building capability, fewer respondents experience downstream outcomes that require organisational recognition (expanded roles and wage adjustments). This pattern motivates the mechanism-focused models presented below.

Figure 1 Distribution of gains within WSQ training



Theory-informed results using the M1–M7 model sequence

To interpret WSQ outcomes in a policy-relevant way, the regression models are structured to test the four pathways outlined in the theoretical framework: Human Capital (skills accumulation), Skills Utilisation (performance improvement), Talent Management (role expansion), and Signalling (credential recognition beyond observed outcomes). All models include controls (e.g., demographic and job factors) to reduce confounding from observable characteristics.

Do WSQ levels build capability and convert it into workplace value? (M1–M3)

M1 (Human Capital test):

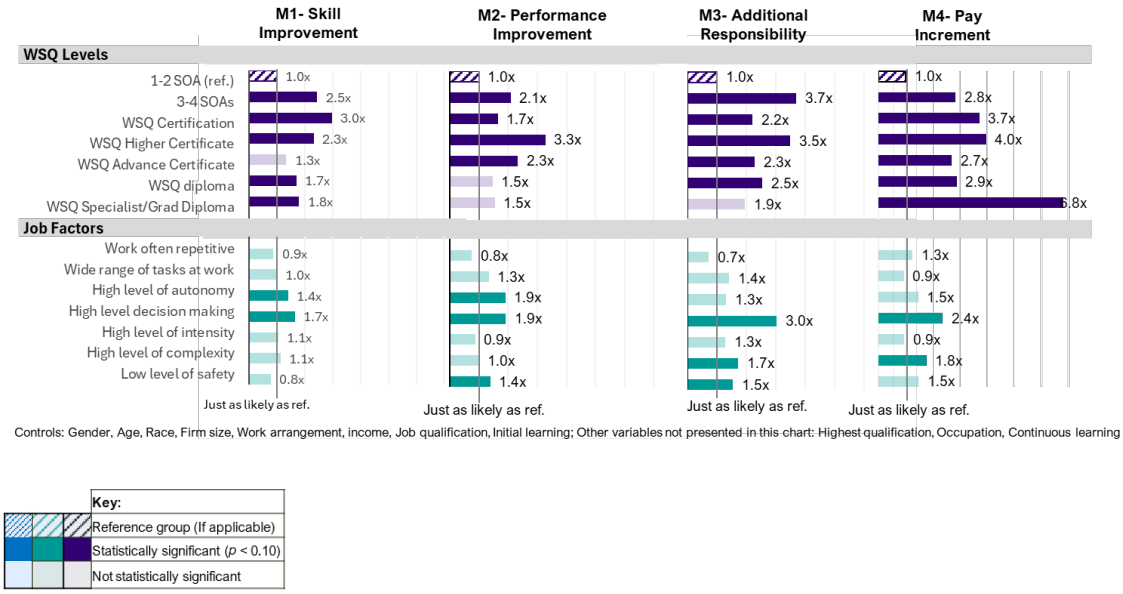
Through the logistic regression analysis using survey respondents with only 1-2 SOAs as a reference group, we see that several WSQ levels have greater probability self-reporting skills gains, most notably survey respondent groups that list WSQ Certificate (odds ratio=2.98, p<0.001) and WSQ Higher Certificate (odds ratio = 2.33, p=0.01) as their highest attained certification; additionally, survey respondents that did not attain a WSQ full qualification but obtained 3-4 SOAs also had greater probability reporting skill gains, odds ratio = 2.45, p =0.01 (see Figure 2). This pattern supports the human capital proposition that WSQ participation is associated with perceived capability-building. However, not all higher credentials show equally strong skill effects (e.g., WSQ Advanced Certificate is not significantly different from the reference group for reported skill gains, odds ratio = 1.34, p=0.26), suggesting that "moving up" the qualification ladder is not uniformly reflected as incremental self-reported skill gain.

M2 (Skills Utilisation test):

M2 tests whether WSQ-associated capability is used in ways that improve performance at work. Here, WSQ Higher Certificate (odds ratio=3.28, p<0.01) and 3-4 SOAs (odds ratio=2.09, p=0.02) stand out, with WSQ Advanced Certificate (odds ratio=2.33, p<0.01) also showing a significant positive relationship. WSQ Certificate (odds ratio=1.65, p=0.10) is positive but not statistically significant. Taken together, the M1 to M2 pattern implies that skills gains do not automatically

become workplace value; rather, value emerges when skills can be utilised to improve performance. This is consistent with a skills utilisation/transfer-of-training interpretation.

Figure 2 Associations between WSQ qualification level and (M1) skill improvement, (M2) performance improvement, (M3) additional responsibility, and (M4) pay increment



M3 (Talent Management test):

M3 assesses whether WSQ engagement is positively associated with reported role expansion, consistent with talent management/internal labour market mechanisms. The largest effects appear for 3-4 SOAs (odds ratio=3.68, p<0.01) and WSQ Higher Certificate (odds ratio=3.47, p<0.01), with WSQ Diploma (odds ratio=2.52, p=0.01), WSQ Advanced Certificate (odds ratio=2.28, p=0.02), and WSQ Certificate (odds ratio=2.20, p=0.03) also predicting responsibility expansion. This indicates that for several WSQ levels, the WSQ signal is associated not only with capability and performance, but also with employers entrusting workers with broader roles, a key TM mechanism.

Synthesis across M1–M3 (pathway diagnosis):

The findings reject H_{null} for M1, M2 and M3 where WSQ engagement is significantly and positively associated with skills improvement, performance improvement and responsibility expansion. This suggests that WSQ is associated not only with capability formation, but also with workplace application and role expansion.

The combined pattern suggests three empirically distinct “pathways”:

- Skills utilisation beyond human capital is evident for 3-4 SOAs, WSQ Certificate, WSQ Higher Certificate, and WSQ Advanced Certificate as these credentials are linked to skills gains and also to improvements that imply workplace application.

- Talent management (role expansion) is most evident for 3-4 SOAs, WSQ Higher Certificate, WSQ Advanced Certificate, and WSQ Diploma, where responsibility gains are pronounced.

- Signalling (hypothesised) is most plausible where pay effects remain even when performance and responsibility pathways are accounted for (tested explicitly in M7 below).

Does WSQ predict pay directly, and through which mechanisms? (M4 then M5–M7)

M4 (Pay increment, baseline):
Before accounting for these intermediate workplace outcomes, several WSQ levels are associated with pay increments relative to 1-2 SOAs, particularly WSQ Specialist/Graduate Diploma (odds ratio=6.82, p<0.01), WSQ Higher Certificate (odd ratio=3.97, p=0.01), and WSQ Certificate (odds ratio=3.71, p=0.01), with 3-4 SOAs (odds ratio=2.83, p=0.04), WSQ Advanced Certificate (odds ratio=2.69, p=0.04), and WSQ Diploma (odds ratio=2.88, p=0.03) also positive (see Figure 2). However, M4 alone cannot distinguish whether pay is rising because workers became more productive, took on larger roles, or because the credential itself is being rewarded.

To unpack this, models M5–M7 sequentially introduce the hypothesised mediators:

Pay pathway decomposition: accounting for performance and responsibility (M5–M6)

To unpack whether WSQ is associated with pay directly or mainly through workplace conversion mechanisms, Models M5 and M6 examine how the WSQ and pay relationship changes when we account for (i) skills gain and utilisation (SU pathway), and (ii) added responsibility (TM pathway) as shown in Figure 3.

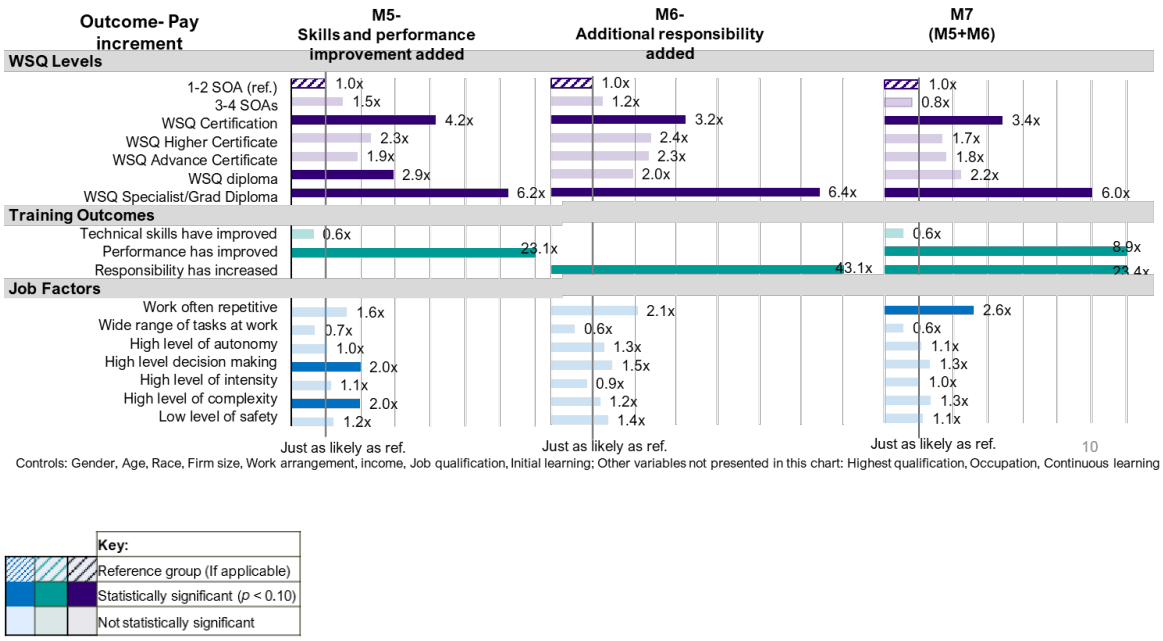
M5 (Pay after accounting for skills and performance):
M5 extends the baseline pay model by adding (i) skills improvement and (ii) performance improvement. This tests whether any WSQ and pay association is explained by human capital gains (HC) and/or by whether those gains show up as improved performance (SU).

Once skills and performance are included, the model shows that performance improvement shows a very strong association with reported pay increment (odds ratio=23.14, p<0.01), while technical skill improvement is not significantly associated with pay increments after performance improvement is taken into account (odds ratio=0.65, p=0.32) (see Figure 3). This supports the interpretation that skills gains only become wage-relevant when they show up as improved performance (HC must be realised through SU). Therefore, in M5, H_{null} is rejected for performance improvement but not for technical skills improvement. Performance improvement is strongly associated with pay increment, while technical skills improvement is not statistically significant after performance is taken into account.

M6 (Pay after adding responsibility):
When additional responsibility is added, it shows a very strong independent association with pay

(odds ratio=43.12, p<0.01). Therefore, H_{null} is rejected for responsibility expansion, which is strongly associated with pay increment. This demonstrates a second pathway: pay rises not only when skills are used to improve performance, but also when employers expand job scope, a distinct talent management pathway. This supports a TM interpretation: WSQ contributes to pay most clearly when employers convert capability into expanded responsibilities, a workplace decision that sits beyond training participation itself.

Figure 3 Pay models (M5-M7): WSQ qualification effects on pay after accounting for skill/performance improvement and additional responsibility



Key:
Reference group (If applicable)
Statistically significant ($p < 0.10$)
Not statistically significant

M7 (Pay with skills + performance + responsibility added):

In M7, H_{null} is rejected for both performance improvement and responsibility expansion, but not for technical skills improvement. This suggests that pay outcomes are more closely associated with workplace application and role expansion than with skills gains alone. With performance and responsibility in the same model, both remain strong predictors, indicating two independent pathways to pay:

1. HC + SU route: training-related capability is utilised and shows up as improved performance → pay gains; and

2. TM route: employers redesign roles/expand responsibility → pay gains.

Crucially, WSQ Specialist/Graduate Diploma remains strongly associated with pay even after accounting for performance and responsibility (odds ratio= 6.02, p=0.01). This constitutes the clearest evidence of a residual credential effect consistent with signalling: the qualification appears to carry labour-market or internal labour-market value beyond what is captured by self-reported performance and role expansion.

Interpreting the WSQ levels using the full M1–M7 sequence

Putting the evidence together:

- 3-4 SOAs: Strongly predicts skills, performance, and responsibility in M1-M3, but its pay association weakens substantially once mediators are included in M7. This pattern implies that 3-4 SOAs generate pay mainly through realised workplace value (performance and/or role expansion), not because the credential is rewarded on its own.

- WSQ Higher Certificate: Shows clear links to skills, performance, and responsibility (M1-M3), and its pay association weakens once mediators are included (M7). This points to a predominantly SU + TM route: benefits arise when skills are applied at work and employers recognise capability through role expansion.

- WSQ Advanced Certificate: Although skills gains (HC) are not statistically significant in M1, Advanced Certificate predicts performance improvements (SU) and responsibility expansion (TM) in M2-M3. Its pay association does not persist once workplace mediators are accounted for (M7). This suggests a conversion-led pattern: impact shows up in how work is done and what work is assigned, even when measured "skills gain" does not register strongly on the broad HC measure.

- WSQ Diploma: Diploma predicts skills gains in M1 and responsibility expansion in M3, while performance gains in M2 are weaker/less consistent. Its pay association does not remain once mediators are included (M7). Overall, this suggests a TM-leaning pattern as skills are present, but pay gains depend mainly on whether employers translate capability into additional responsibilities.

- WSQ Specialist/Graduate Diploma: Specialist/Graduate Diploma predicts skills gains in M1, but shows non-significant links to performance and responsibility in M2-M3. Yet its pay association remains large even after accounting for skills, performance, and responsibility (M7). This is most consistent with residual credential signalling, where the credential is rewarded beyond the measured workplace outcomes.

- WSQ Certificate: Certification predicts skills gains in M1, and shows borderline performance gains in M2 alongside clear responsibility expansion in M3. It also shows a residual pay effect after accounting for mediators (M7). This indicates a mixed pattern: part of the value operates through SU + TM, with an additional component reflecting credential recognition in specific contexts (e.g., employer HR rules, job structures, or sector norms).

Job factors: why workplace conditions matter for "realising" WSQ value

Across models, job design variables (e.g., autonomy, decision-making, complexity, repetitiveness) also show meaningful associations with outcomes. The pattern is consistent with the mechanism story: workplaces that provide discretion, decision authority, and complex tasks are more likely to

convert training into performance and responsibility gains, which are the two pathways that consistently predict pay in M7. Conversely, highly repetitive work tends to be less conducive to responsibility expansion and skill deployment, implying that even when WSQ builds capability, work design can constrain whether that capability translates into valued outcomes.

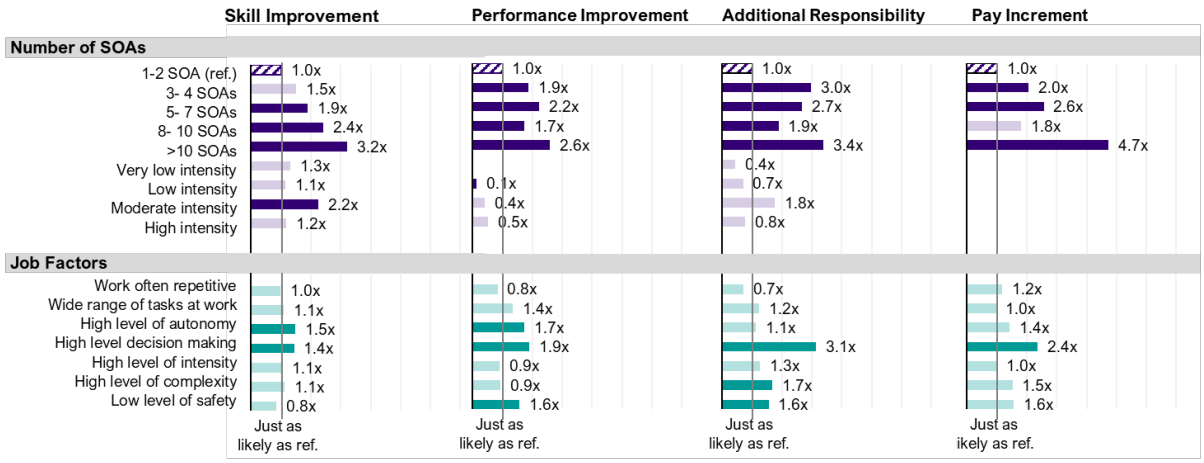
Overall implication of M1-M7: WSQ's contribution to wage outcomes is best understood as a two-pathway value realisation model: (i) skills utilised to improve performance, and (ii) employer-driven role expansion, with limited pure signalling except most clearly for the WSQ Specialist/Graduate Diploma (and a likely institutionally-shaped effect for WSQ Certificate).

WSQ SOA accumulation outperforms non-WSQ training intensity in driving workplace outcomes

This finding compares two "dose" measures of training participation: (i) WSQ depth measured by the number of WSQ Statements of Attainment (SOAs) accumulated, and (ii) training intensity among non-WSQ learners. The objective is to assess whether outcomes are more strongly associated with recognised WSQ progression or with simply undertaking more training outside WSQ. The analysis considers four outcomes, skill improvement, performance improvement, additional responsibility, and pay increment, with controls held constant as in earlier models.

Overall, the results show that SOA accumulation is associated with stronger and more consistent gains across outcomes than non-WSQ training intensity (see Figure 4). Compared with the 1-2 SOA reference group, higher SOA accumulation is positively associated with reported skills improvement, with the association becoming statistically significant from 5-7 SOAs onwards: 5-7 SOAs (odds ratio = 1.90, $p = 0.01$), 8-10 SOAs (odds ratio = 2.40, $p < 0.01$), and more than 10 SOAs (odds ratio = 3.22, $p < 0.01$). Importantly, the same pattern extends beyond perceived learning to workplace value: For performance improvement, significant positive associations are observed for 3-4 SOAs (odds ratio = 1.86, $p = 0.02$), 5-7 SOAs (odds ratio = 2.24, $p = 0.00$), and more than 10 SOAs (odds ratio = 2.59, $p = 0.00$). For additional responsibility, 3-4 SOAs, 5-7 SOAs and more than 10 SOAs are also significantly associated with higher reported responsibility expansion (odds ratios = 2.96, 2.67 and 3.38 respectively, all $p < 0.01$). Pay increments show a similar but less uniform pattern, with significant associations for 5-7 SOAs (odds ratio = 2.57, $p = 0.02$) and more than 10 SOAs (odds ratio = 4.72, $p = 0.00$), while 3-4 SOAs is positive but only marginally significant (odds ratio = 2.05, $p = 0.08$).

Figure 4 WSQ SOA accumulation versus non-WSQ training intensity: associations with skill improvement, performance improvement, additional responsibility, and pay increment



Controls: Gender, Age, Race, Firmsize, Work arrangement, income, Job qualification, Initial learning; Other variables not presented in this chart: Highest qualification, Occupation, Continuous learning
#Note: Difference between WSQ and non-WSQ required sectors is highly significant for responsibility and pay (p<0.05)

Key:
Reference group (If applicable)
Statistically significant ($p < 0.10$)
Not statistically significant

The contrast is especially pronounced for outcomes that reflect workplace recognition and value realisation. While non-WSQ training intensity shows at best mixed links to skill improvement, it is particularly weak in predicting performance improvement and additional responsibility, indicating limited conversion of training into observable workplace contribution or role expansion. By comparison, WSQ SOA accumulation is strongly related to responsibility expansion, consistent with a talent management interpretation in which employers allocate broader roles when training is recognised and perceived as relevant. Similarly, WSQ SOA accumulation is associated with higher likelihood of pay increments, especially at higher SOA bands, aligning with earlier evidence that pay gains are more likely when training is connected to performance and/or expanded job scope rather than skills gains in isolation.

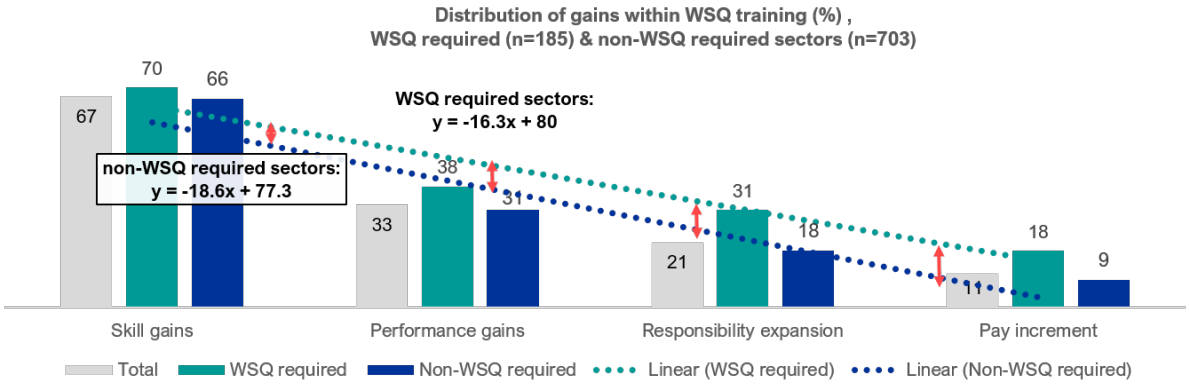
Taken together, this finding suggests that recognised progression within WSQ (as reflected in SOA accumulation) is more likely to produce consistent training outcomes than simply increasing non-WSQ training intensity. The results underscore the importance of organisational recognition in translating training into rewards: when training is embedded in formal frameworks that employers value (and potentially reinforced in WSQ-required sectors), it is more likely to shape performance expectations, role allocation, and ultimately pay outcomes. In policy terms, the implication is that evaluating training effectiveness should move beyond counting participation or hours and instead consider structured progression and recognition mechanisms, such as SOA accumulation, that better predict whether training becomes meaningful workplace value.

Sector context: WSQ-required sectors strengthen value realisation

Beyond the extent of WSQ training participation, the results indicate that sector context matters for whether training translates into workplace rewards. The difference between WSQ-required sectors and non-WSQ required sectors is relatively small for skills gains, with 70% of respondents in WSQ-required sectors and 66% in non-WSQ-required sectors reporting skills gains. However, the sector difference become more pronounced across workplace outcomes, in particular, WSQ-required sectors exhibit systematically higher returns, especially for additional responsibility and pay increment, with the difference between WSQ-required and non-WSQ-required sectors being statistically significant. In WSQ-required sectors, 31% of respondents reported taking on additional responsibilities after WSQ training, compared with 18% in non-WSQ-required sectors. Similarly, 18% of respondents in WSQ-required sectors reported a pay increment, compared with 9% in non-WSQ-required sectors (Figure 5). The trend lines show that outcomes taper from skills gains, to responsibility expansion to pay increment, but the decline is steeper in non-WSQ required sectors, suggesting weaker conversion from skills gains into responsibility and pay outcomes. This pattern reinforces the interpretation that training outcomes are not determined by training volume alone, but also by whether WSQ is institutionalised in job roles and progression structures.

Overall, the findings reinforce the interpretation that WSQ outcomes are not shaped by training participation alone. Where WSQ is more embedded in job requirements, role expectations or progression structures, training appears more likely to be linked to responsibility expansion and pay recognition.

Figure 5 Distribution of gains within WSQ training by WSQ & non-WSQ required sectors



Note: WSQ-required sectors are based on SSG's advice, and refer to sectors where ≥75% of WSQ courses in the sector are whitelisted by SAs for WSQ credential

Recognition mechanisms are the missing link

Where WSQ is required or strongly embedded, employers are more likely to have established job ladders, role requirements, and reward norms that recognise WSQ progression. As a result, the

same training investment is more likely to convert into expanded responsibilities and wage progression. Conversely, in sectors where WSQ is not required, training, particularly non-WSQ training, may improve skills but is less consistently linked to employer-recognised changes in performance expectations, role scope, or pay decisions.

Qualitative triangulation of pathways from WSQ to workplace outcomes

To complement the quantitative findings (Findings 1-2), employee interviews shed light on *how* WSQ training translates into workplace value in practice. Three recurring themes emerged that map closely onto the evaluation's pathway logic, human capital (skills gains), skills utilisation (performance translation), and talent management (employer recognition and progression decisions).

Skills gains: Employees generally find WSQ practical and job-relevant (Human Capital)

Employees commonly described WSQ as immediately applicable to their current work tasks, often contrasting it with more abstract forms of learning. Participants emphasised that WSQ provided concrete, usable capabilities, such as digital marketing tools and techniques, that could be applied directly in their roles (e.g., content creation and advertising workflows).

> "I recently did a WSQ [in] digital marketing… I learned how to do Canva editing, promoting through Facebook advertisement, it gives me a wider glance on how to market [my] products [using] SEO, SEN." — I5, Mid-career individual working in the insurance Industry

> "I attended [WSQ courses] the last few weeks… and I find [them] very beneficial to my line of work. We only know the superficial [before]. By attending these courses it really enhances my skill set... I know the basic[s], the significance, and the impact that really matters to all these relevant platforms like Instagram, Facebook or TikTok."

This aligns with the quantitative pattern that WSQ participation is strongly associated with reported skill improvement, particularly at higher levels of WSQ engagement.

Performance gains depend on whether skills can be applied at work (Skills Utilisation)

Interview accounts highlight that performance improvements are not automatic. Where employees had real opportunities to apply what they learned—through supportive work processes, client needs, or autonomy in task execution—they reported clearer performance benefits. For example, one participant described using newly learned approaches on platforms such as TikTok and photography-related skills to strengthen business outcomes.

> "After [going for] all the TikTok and photography class[es]... [I] learned how to make use of [these] new technolog[ies] to promote service[s] or sell item[s]... [When] my friends... have tickets [to sell], I can help sell at Carousell [or] TikTok... [For example, if] I go [to] JB [and] I see [something trendy] like LaBubu, [I will buy] some, then I promote [them on] Carousell and TikTok... Yeah, it helped me a lot, because nowadays TikTok very popular lah. If you

> don't know how to make use of the TikTok to monetise, then you'll lose out." — I6, Self-employed mid-career individual

In contrast, when job scope was fixed or when skills did not map onto day-to-day work demands, employees perceived limited impact beyond personal learning. Some described situations where training was tolerated as long as it did not disrupt working hours, but did not translate into recognition or changes in work outputs.

> [When asked about changes in role/responsibility after taking WSQ]: "It's for my own self-knowledge... my role is not project manager role, so they don't recognise it. In terms of recognition, no, I don't get that. They allow me to go for the courses as long as it doesn't affect the 8 to 6 hours." — I4, Mid-career individual in the finance sector

This directly reinforces the quantitative evidence that skill gains contribute to pay only when they translate into performance improvements—i.e., WSQ creates potential value, but workplaces determine whether value is realised.

Progression and rewards are shaped by employer strategy (Talent Management)

Employees' accounts suggest that WSQ delivers labour-market value most consistently when employers treat it as a recognised credential within workplace talent processes, rather than as stand-alone training. In particular, WSQ appears to matter when managers actively encourage take-up as part of workforce development, and when employers read WSQ as credible "paper" recognition of workplace competence during selection.

> "Between poly [qualifications] and WSQ, employers [prefer] WSQ because the skill is already there, and WSQ 'polish[es] up' [skills] as a paper [qualification]. [Some] have academic qualifications, but they do not know the work processes. WSQ is a stepping stone [because it recognises workplace skills], especially for those with low education, like me, to slowly climb up. That is what I do now [in] my department: [as a supervisor], I push [my staff] to take WSQ courses. In interviews, if they see I have WSQ, it is a platform to show I am recognised by the institution." — I3, WSH Manager (Mid-late career individual)

Where employers actively recognise WSQ within their talent processes, it can serve as a credible entry point into progression pathways that would otherwise be closed to lower-qualified workers.

Yet I3's account also illustrates the limits of this recognition: while WSQ opened the initial pathway into WSH and supported his first promotion, it was his company's sponsorship of a degree, and his own strong performance during a major incident, that ultimately unlocked his progression to more senior roles. This pattern suggests that employer TM, where it exists, still tends to be degree-anchored at higher levels, with WSQ functioning as a bridging mechanism rather than a full progression ladder.

> "I just completed my degree [honours], [which] was sponsored by my company. Once I got my degree… within 6 months, they promote me [again]. [But] the double promotion is because of [an] accident… [I did] the investigation, the reporting, everything. I did very well, so I was highly recommended by the Chief Technical Officer… and the managing director supported [it]."

Conversely, when employer strategy does not incorporate WSQ into talent management processes, employees viewed WSQ as largely self-driven upskilling that did not affect promotion decisions, even when they felt personally more competent.

> "When I attended [WSQ programmes], it was more for increasing my knowledge and understanding, but in terms of the job market, career trajectory, I don't think there is any difference." — I7, Mid-career individual doing freelance marketing

This triangulates strongly with the quantitative finding that responsibility expansion is a key pathway to pay, and that organisational recognition is critical for translating training into rewards.

Taken together, the employee accounts point to a conditional form of talent management: WSQ delivers progression value when employers are structurally set up to recognise it, but this recognition is neither automatic nor consistent, and where degree credentials still dominate at higher levels, WSQ's contribution becomes difficult to distinguish from individual performance and employer discretion.

Overall implication from employee perspectives

Taken together, employee interviews support a consistent interpretation: WSQ is widely perceived to deliver practical skills gains, but the extent to which these gains become performance improvements, expanded responsibilities, and rewards depends heavily on skills utilisation opportunities and employer recognition practices. This qualitative evidence strengthens the mechanism story established in Findings 1-2 by clarifying why WSQ progression (e.g., SOA accumulation) tends to show more reliable workplace returns than non-WSQ training intensity, namely, because the outcomes depend not only on training received, but also on whether employers and job contexts enable application and formally recognise the training in progression decisions.

The employee interviews corroborate the quantitative results in two ways. First, employees frequently describe WSQ as practical and job-relevant, aligning with the strong association between WSQ participation and reported skills improvement. Second, interview accounts clarify why skills gains do not always translate into performance, responsibility, or pay: realised impact depends on whether workers have opportunities to apply new skills and whether employers formally recognise WSQ in role assignment and progression decisions. This points to the organisational mechanisms that sit behind the observed pathways and motivates the next section, which examines employer and training provider perspectives on how WSQ is used, recognised, and rewarded within workplace systems.

While employee narratives provide insight into perceived mechanisms, decisions on role and pay ultimately sit with employers; the next section therefore focuses on employer rationales and organisational practices that enable (or constrain) WSQ value realisation.

Employer Findings

How organisations realise (or block) WSQ value

This section synthesises evidence from employer interviews (n=10) and the employer survey (n=50) to explain how WSQ is interpreted and used by organisations, and why training outcomes vary across firms. Across both data sources, a consistent pattern emerges: employers differ markedly in whether they treat WSQ as (i) a compliance requirement, (ii) a capability-building tool with uneven translation to workplace outcomes, or (iii) a strategically embedded talent management system. These orientations help explain why WSQ can generate skills gains but may still fail to translate into performance improvements, role expansion, and pay progression when organisational recognition and utilisation mechanisms are weak.

Triangulating employer orientations: interview archetypes and survey clusters converge

Employer interviews identify three archetypes that map closely onto the evaluation's underlying pathways, human capital (HC), skills utilisation (SU), and talent management (TM), and the organisational conditions required to convert training into rewards. The employer survey clustering independently yields a parallel three-group structure. Taken together, the qualitative archetypes explain the organisational logic behind the quantitative segments, while the clusters provide a population-level distribution of these orientations.

Employer archetypes from interviews: three distinct orientations towards WSQ

Interview findings suggest three overarching archetypes that map closely onto the evaluation's HC/SU/TM logic.

Disengaged employers: minimal to no WSQ engagement

Some employers report little interest in WSQ and do not perceive it as adding value to their workforce. In these organisations, WSQ is viewed as misaligned with their business needs, workforce profile, or operating context. Where WSQ engagement exists, it may be limited to basic awareness without adoption.

> [Having] a WSQ certificate really doesn't add anything to our operations. We're basically looking at someone who can execute, who can do the work. We don't really look at whether they have the WSQ cert." (Director, Early Childhood/Events SME)

Furthermore, when asked what WSQ provision existed for their sector, the director indicated they had not encountered any relevant WSQ programmes, and they later added that because their staff were already required to have early childhood diplomas, an additional long-duration WSQ qualification was seen as largely irrelevant. This suggests limited awareness of available WSQ provision, which reinforces the lack of perceived fit: where

employers do not readily see relevant options, WSQ is more easily dismissed as redundant relative to existing entry requirements and internal staffing norms.

A related subtype consists of compliance-only employers, who participate largely to meet regulatory requirements (e.g., in WSQ-required/PWM sectors) but do not expect WSQ to generate performance or progression value. Here, WSQ is treated as a requirement to be met rather than a lever for capability building or talent development.

> *"The reason why we signed up for all these [WSQ] courses last year is because of the PWM [Progressive Wage Model] requirements. They require us to attend some [WSQ] courses in order to meet the requirement to employ foreign workers."* (Manager, Wholesale SME)

Even where participation occurs, it is often instrumental. WSQ uptake is driven by the need to satisfy compliance conditions, with limited evidence that employers subsequently integrate WSQ into job design, performance management, or progression decisions. These disengaged orientations suggest that WSQ gains traction primarily through external pressures rather than intrinsic perceived value, highlighting the challenge of demonstrating relevance beyond regulatory compliance.

Performance-oriented employers: seek capability improvements but outcomes vary

A second group engages WSQ primarily to improve performance and operational capability, but the extent of value realisation depends on contextualisation and job design. In "unmet needs" cases, employers perceive WSQ as insufficiently aligned to operational realities, and indicate that adoption would strengthen if training were better contextualised to sector or firm needs.

> *"In the past, I have hired people with WSQ training, and… sent my staff to training, so I'm not averse to it. If I had a young, bright spark that I felt would really benefit from it, I wouldn't hesitate.[But] if you're a creative, the only thing that really sells you is the work you've done. The portfolio is everything." (Director, Creative agency SME)*

While these employers acknowledge WSQ's training value, the absence of sufficient contextualisation limits operational relevance and adoption for such employers. In contrast, other performance-oriented employers report clearer operational returns when WSQ is tightly integrated with work processes and contextualised to job requirements.

> "WSQ training is one of our key strateg[ies] that we use in terms of how we upskill our staff, especially the frontliner[s]... We worked with Singapore Poly to contextualize two WSQ modules and two non-WSQ modules... [However, while] we train them to be ready for the next role, we don't guarantee that the person will be

promoted... The moment we start to talk about promotion, how to get from one grade to another grade then HR will be... gancheong (worried)." (Senior Manager, government-linked organisation, retail sector)

In such "realised performance gains" cases, employers report tangible performance improvements because WSQ is successfully integrated with work processes and job requirements, however, they may still not treat WSQ as a pathway for career growth or progression. Performance gains thus materialise when training aligns with job demands, but the conversion of improved capability into career progression requires institutional mechanisms that many employers have not established.

Talent management employers: WSQ strategically embedded into progression systems

A smaller set of employers describe WSQ as deliberately embedded into selection, development, role assignment, and progression decisions. These firms use WSQ not just for training delivery but as a structured workforce development tool that supports internal mobility and capability progression.

Two subtypes appear in the interviews. Some employers show **limited capacity**: they attempt to use WSQ for talent management but face constraints such as limited higher-level roles and restricted compensation headroom (often linked to weaker business models).

> "[For] security officers, their career progression path is already there because of PWM... they can progress from a security officer all the way to... chief security officer. [However,] as they progress [through WSQ certifications], the higher you go, the lesser available opportunities there are... I don't have a job for [all of] them." (General Manager, Medium-large enterprise, security sector)

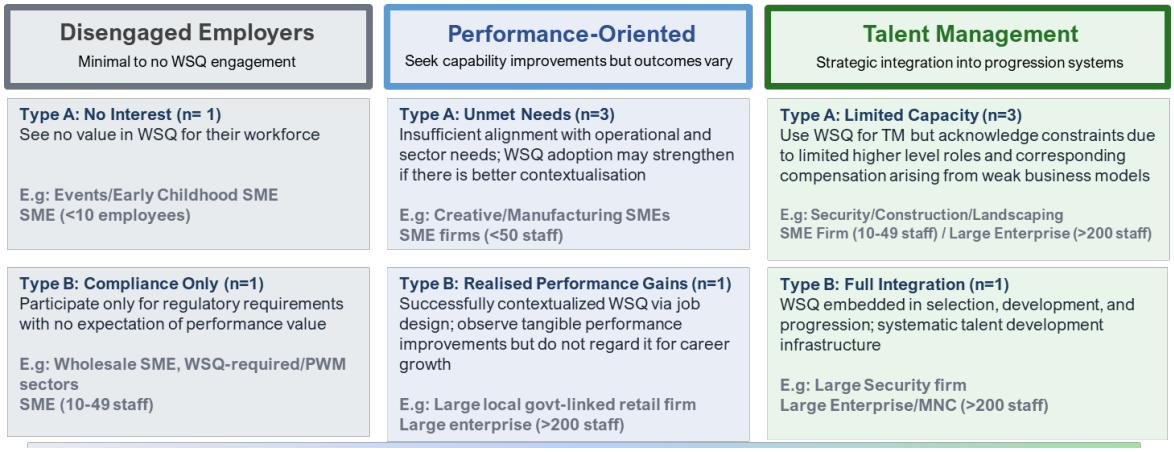
In these cases, WSQ can raise capability, but its talent management function is constrained by the organisation's business strategy and operating model. Employers described limited availability of higher-level roles and constrained wage headroom, such that certifications can accumulate faster than progression opportunities, reducing the likelihood that WSQ translates into advancement.

Others show **full integration**, where WSQ is systematically embedded and supported by clear talent development infrastructure—making it more likely that training translates into expanded responsibilities and progression outcomes.

"Because security is quite a heavily regulated framework, the PWM doesn't only peg the qualification, but also pegs the pay structure. Depending on what are the WSQ certifications that [the security officers] have, we base it against the framework, or the PWM model, and we see which level do they fit in within the structure… It is bringing the industry forward by multiple bounds." (Assistant Vice President, Large enterprise, security sector)The contrast between limited capacity and full integration suggests that regulation nor employer

orientation towards TM alone do not determine whether WSQ operates as a genuine talent management lever. Even within PWM-linked sectors, employers vary in whether they treat WSQ as an administratively legible requirement or as an organising device for selection, deployment, and progression. Where firms have both the organisational infrastructure and managerial intent to translate credentials into role assignment and pay placement, WSQ is more likely to produce expanded responsibilities and progression outcomes. Where business constraints limit role availability and wage headroom, WSQ tends to outpace the organisation's capacity to absorb newly certified workers into higher-scope positions.

Figure 6 Employer archetypes in WSQ adoption: Disengaged, performance-oriented, and talent management approaches (qualitative typology)



Employer survey clustering: three clusters of WSQ engagement

To segment employers by their WSQ engagement patterns, we conducted an exploratory hierarchical agglomerative cluster analysis using Ward's minimum-variance linkage method (Ward linkage). Clustering was performed on three sets of indicators capturing employers' WSQ orientation and usage:

- Why employers use WSQ (perceived preparedness and effectiveness of WSQ, alignment of WSQ to job roles/skills needs, and whether the WSQ framework keeps pace with evolving skills demand).
- How employers use WSQ (use of WSQ for promotion decisions, identifying training needs, and supporting the design of in-house training).
- Academic qualification orientation (preparedness and promotion reliance based on academic qualifications, as a comparator to WSQ).

This produced a coherent three-cluster solution:

- **Cluster 1: Disengaged (30%, n=15)**—consistently rejects WSQ across dimensions and shows weak endorsement of both WSQ and formal qualification systems as strategic levers.

- **Cluster 2: Talent management (24%, n=12)**—strong positive orientation across measures; WSQ is viewed as effective for competency development and role matching, and more often embedded into HR practices as a progression tool.

- **Cluster 3: Performance-oriented (46%, n=23)**—neutral on WSQ; acknowledges potential benefits but lacks commitment or organisational mechanisms for systematic implementation; the largest segment.

Importantly, this quantitative segmentation mirrors the qualitative archetypes: disengaged mirrors Cluster 1, talent management mirrors Cluster 2, and performance-oriented mirrors Cluster 3. Deviations (e.g., compliance-only employers) are expected because interviews capture intent and contextual constraints, whereas clustering reflects similarity across multiple survey indicators.

Organisational characteristics associated with cluster membership

Sector and firm size

Cluster membership is patterned by sector context and organisational capacity. Cluster 2 employers include a mix of WSQ-required and non-WSQ-required sectors, with a notably higher concentration of WSQ-required employers relative to the other clusters. In addition, about half of Cluster 2 employers are in large organisations, suggesting that stronger HR infrastructure and regulatory/sectoral embedding are associated with deeper WSQ integration.

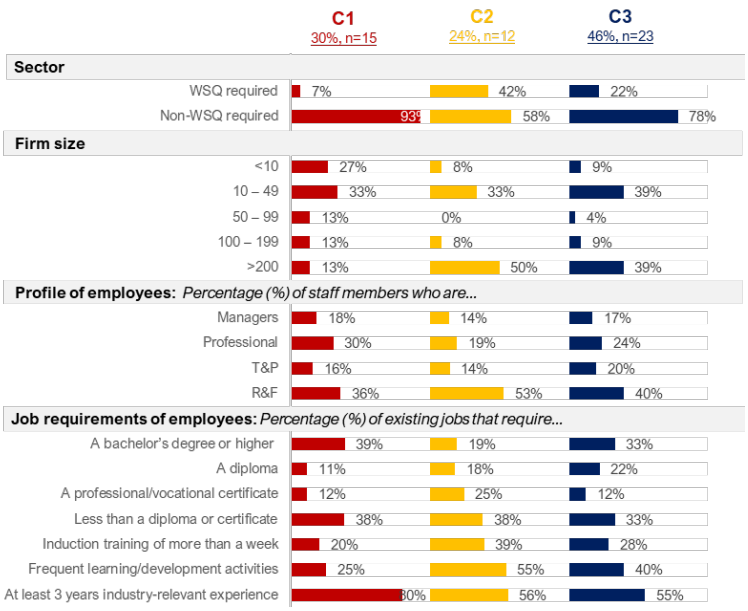
By contrast, Clusters 1 and 3 operate mainly in non-WSQ-required sectors, and show more varied firm-size distributions. This reinforces the interpretation that WSQ engagement is not driven purely by "whether WSQ exists," but by whether it is supported by sectoral requirements and organisational structures that make systematic adoption feasible.

Workforce profile and job requirements

The clusters also differ in workforce composition and development practices. Cluster 1 has the highest proportion of professionals but reports comparatively minimal learning activities, consistent with a model that relies more on pre-existing credentials and hiring than on ongoing development. Across all three clusters, employers tend to prioritise industry-relevant experience over formal educational credentials, and job requirements appear broadly comparable. This suggests that differences in WSQ engagement are less about baseline credential preferences and more about how employers implement skills development and progression practices.

Overall, cluster differences appear more strongly driven by sector, firm size, and workforce composition (including a higher share of rank-and-file roles), rather than large differences in formal job or educational requirements.

Figure 7 Employer Cluster Profiles by Sector, Firm Size, Workforce Composition, and Job Requirements



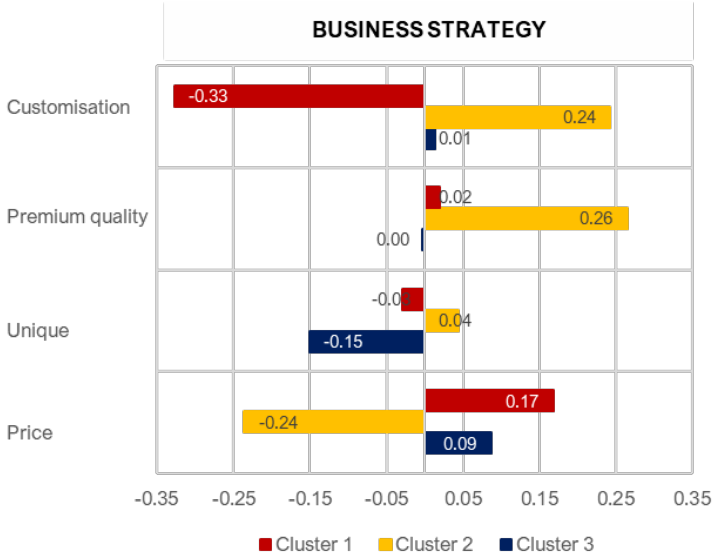
Business and people strategy performance: what differentiates the clusters

Business strategy orientation

Clear differences emerge in business strategy positioning. Cluster 2 employers score highest on premium quality and customisation, consistent with firms that compete through value-based differentiation. This aligns with the cluster's strategic WSQ integration, suggesting that WSQ is more likely to be adopted as a talent system where firms require stronger, more adaptable capabilities to support differentiated products and services.

In contrast, Cluster 1 employers lean toward price-based competition and show weak customisation, indicating that WSQ may be perceived as offering limited value within business models that prioritise cost minimisation over capability-driven differentiation. Cluster 3 shows the weakest differentiation overall, which suggests that even when firms acknowledge capability-building benefits, these do not reliably translate into a sharper competitive positioning.

Figure 8 Employer Clusters by Business Strategy

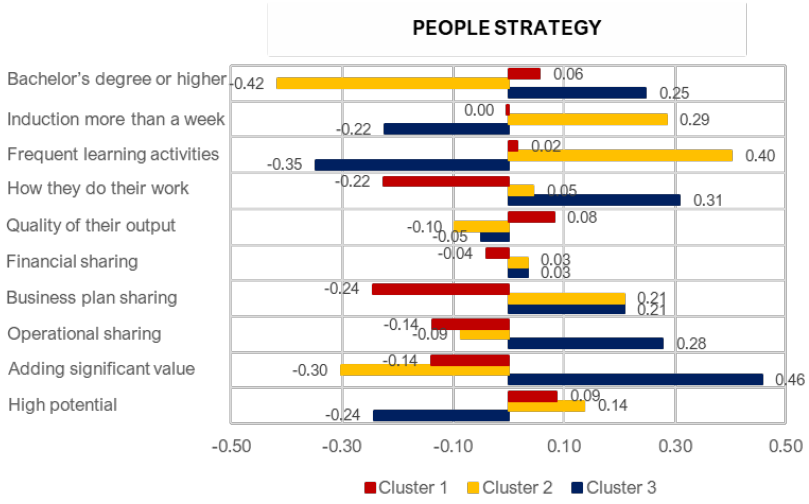


People strategy practices

Interestingly, Cluster 3 demonstrates stronger people strategy practices across several dimensions, particularly on indicators related to learning activities and workplace practices, despite being neutral on WSQ specifically. This suggests that many performance-oriented employers may invest in workforce practices but do not view WSQ as the primary lever for doing so, or face barriers to adopting WSQ in a systematic way.

Cluster 1, by comparison, shows the weakest people strategy profile and minimal workforce development investment, consistent with fundamental disengagement from structured talent management practices.

Figure 9 Employer Clusters by People Strategy



WSQ impact on workforce: perceived improvements, skills mismatch, and hiring recognition

Perceived improvements since WSQ completion

Employers in Cluster 2 consistently report the strongest improvements since WSQ completion across employee groups (managers/professionals, technicians, and rank-and-file). This provides organisational-level triangulation with the cluster definition: when WSQ is embedded into HR practices as a talent system, employers are more likely to perceive improvements in both transversal and technical capabilities.

In sharp contrast, Cluster 1 reports substantially lower perceived improvements, reinforcing the view that WSQ is not trusted or not effectively translated into workplace outcomes in these firms.

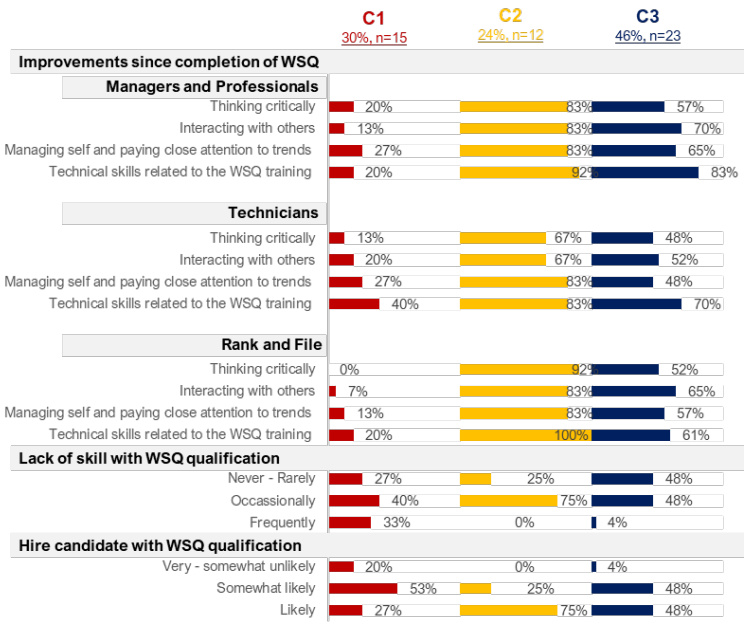
Skills mismatch concerns

A notable risk signal appears in Cluster 1: these employers report that around one-third of employees with WSQ qualifications are perceived to lack necessary job skills. This aligns with their low endorsement of WSQ's effectiveness and suggests that disengagement may be rooted in perceived misalignment between training content and job requirements, weak contextualisation, and/or limited opportunities for skill application at work.

Hiring recognition of WSQ

Across clusters, WSQ shows partial recognition as a hiring signal: around half of employers indicate they are likely to hire a candidate with a WSQ qualification for roles traditionally requiring academic qualifications. However, the strength of this recognition differs by cluster, with Cluster 2 generally the most favourable. This suggests that WSQ can function as an alternative signal of job readiness in some contexts, but recognition is not yet uniform across the employer landscape.

Figure 10 Perceived Improvements from WSQ, Skills Gaps, and WSQ-Based Hiring Likelihood by Employer Cluster



What the cluster patterns imply for WSQ value realisation

Taken together, the combined qualitative and quantitative evidence indicates that WSQ's organisational impact depends on whether employers move beyond participation to systematic integration. Talent management employers (Cluster 2) are most likely to convert WSQ into observable workforce outcomes because WSQ is embedded into role matching, development processes, and progression decisions, conditions that enable skills to be utilised and rewarded. Disengaged employers (Cluster 1) represent a segment where WSQ is perceived as misaligned and not value-adding, associated with minimal workforce development investment and heightened mismatch concerns. Performance-oriented employers (Cluster 3) sit between these poles: many invest in people practices, but WSQ is not consistently adopted as the organising framework for skills development and progression.

This employer segmentation helps explain the earlier learner-side results: WSQ can generate skills gains, but translation into performance, responsibility, and pay depends on employer recognition mechanisms, job design, and progression structures, which vary systematically across employers.

Training provider interview findings: why contextualised WSQ delivery is difficult to scale

To complement learner and employer evidence, interviews with TPs (n=4) highlight a structural constraint in WSQ implementation: the tension between standardisation (required for funding eligibility and quality assurance) and contextualisation (needed for operational relevance and performance impact). Across providers, WSQ's framework requirements and funding arrangements create volume thresholds, making intensive co-creation and tailoring economically viable mainly for

large employers or cohort-based arrangements, while SMEs and one-off requests more often receive generic delivery.

Two alternative operating models were evident in the interviews.

Type A: Customisation-capable providers (co-creation within WSQ limits)

In the first model, training providers work closely with their clients to co-create contextualised content while staying within WSQ framework boundaries. However, this approach is operationally intensive: it requires needs analysis, content co-development, iterative refinement, and closer coordination with the employer.

> "We assess the client and see their business needs, we make the recommendation whether they do the funded [WSQ] or unfunded [non-WSQ] (depending on contextualisation needs)... We [have to] work very closely with them to co-create... [It's] a lot of work." (Training Provider, Soft skills and organisational management)

Providers emphasised that the viability of such customisation depends on scale, either repeated course runs or a sufficiently large employer contract to justify the development costs. Where deeper contextualisation is needed beyond what WSQ funding and framework parameters can support, providers may recommend unfunded training (often outside WSQ) as it allows greater flexibility and faster redesign.

At the same time, providers stressed that contextualisation is bounded by WSQ delivery economics. They described the work of developing "real work-relevant examples" as labour-intensive, and noted that it becomes viable mainly when they can spread the effort across multiple runs.

> "[At] the onset, we always tell clients that if we adjust, or align to their needs, there are still funding requirements, so we are quite strict on that. It's [about] being able to strike a balance in terms of cost design and delivery… Individuals typically don't come to us. We don't offer that many public runs… Even our public generally are to cater to clients who need to send maybe 4 or 5 [people], and they cannot form a class… then… 3 or 4 clients can [combine to] form a class. [For] real work-relevant examples… it's a lot of work, [but] for WSQ, we cannot charge… that's why… we only do [contexualisation] if there's many runs." (Training Provider, Soft skills and organisational management)

This suggests that SMEs may face structurally constrained access to contextualised WSQ training: where demand is fragmented into small cohorts and one-off runs, the co-creation effort required for TPs to tailor content is difficult to sustain under prevailing funding parameters.

Type B: Mass-market providers (standardised delivery optimised for throughput)

In the second model, training providers prioritise a standardised curriculum designed for scale. Content is delivered in largely uniform form across different client types, with limited scope for redesign within WSQ framework requirements and funding parameters. This operating model

supports throughput and cost efficiency, but it tends to limit the depth of employer-specific contextualisation, especially where cohort sizes are small and demand is episodic.

> “It’s actually for everybody, it’s the same… if we conduct [it] for in-house, then we would include some of the SOP and directives… Other than that, our material is actually common for in-house and external.” (Training Provider, landscaping)

Under this model, there is effectively limited customisation for external clients: the provider delivers a common set of materials across cohorts, with any tailoring reserved for their own in-house runs.

Furthermore, a related constraint is that contextualisation is not only costly, but also difficult to sustain within short course durations and modular structures that fragment delivery across multiple units.

> "Because of the duration being so [short]... it is very difficult for us to provide what is expected... If I make a 100-hour [course], then the subsidy portion becomes very unattractive, which the student has to pay from [their] own pocket... And the subsidy is also not that lucrative. So, when I split that into 30-30-30 [shorter courses] to make it more aligned with the framework, I can get the learner for one course, but he may not go to the second and the third… so the end objective may not be achieved " (Training Provider, media/design)

This funding duration constraint limits providers’ ability to offer longer, integrated, workplace-relevant designs for small cohorts; for many SMEs, the resulting offer is a set of short, standardised modules that may not reliably add up to the intended capability outcome.

These constraints suggest an uneven capacity for contextualisation across firm types. Larger employers, with bigger cohorts and repeatable training demand, are better positioned to access contextualised WSQ provision because providers can amortise design effort across multiple runs. By contrast, SMEs with small cohorts and one-off demand are more likely to be served through standardised, framework-aligned modules, as deeper contextualisation is harder to justify under prevailing funding parameters.

Key insight from TPs interviews

Taken together, training provider accounts suggest that WSQ’s current implementation environment produces a structural tension: standardisation supports governance and funding eligibility, while contextualisation can drive operational relevance and stronger workplace impact. In practice, the combination of framework rigidity and volume economics means bespoke training is more viable for larger employers, leaving many SMEs with more generic WSQ provision. This helps explain why training outcomes are uneven: even where employers and workers are motivated, the system-level constraints can limit the extent to which WSQ is adapted to workplace contexts where skills utilisation and performance improvements are realised.

Synthesis of Findings by Research Questions (RQ1–RQ4)

RQ1: What outcomes are associated with WSQ participation?

The findings show a staged pattern across four outcome domains: skills improvement, performance improvement, responsibility expansion and pay increment. Descriptively, reported skills gains are the most common reported outcome, with 67% of WSQ respondents reporting improvement in technical skills after WSQ training. When performance improvement was measured on an extent scale, 33% of respondents indicated that WSQ had improved their job performance “quite a lot” or “a great deal”. Reported responsibility expansion was lower, with 21% indicating that WSQ had helped them take on additional responsibilities “quite a lot” or “a great deal”. Pay increment was the least reported outcome, with 11% indicating that WSQ had contributed to a pay increment “quite a lot” or “a great deal”

The regression model findings, M1- M4 reinforce this staged pattern. WSQ participation is most consistently associated with skills improvement, suggesting that capability formation is the clearest and most immediate outcome. For example, compared with the 1-2 SOA reference group, several WSQ levels are positively associated with reported skills gains, including 3-4 SOAs (odds ratio = 2.45, $p < 0.01$), WSQ Certificate (odds ratio = 2.98, $p < 0.01$), WSQ Higher Certificate (odds ratio = 2.33, $p < 0.01$), WSQ Diploma (odds ratio = 1.70, $p < 0.05$), and WSQ Specialist/Graduate Diploma (odds ratio = 2.22, $p < 0.05$). However, stronger skills effects are not observed uniformly across all higher qualification tiers. For example, WSQ Advanced Certificate is not significantly different from the reference group for reported skills gains (odds ration=1.30, p=0.26)

WSQ participation is also associated with workplace outcomes, although these outcomes are less prevalent than skills gains. For performance improvement, positive associations are observed for selected WSQ levels, such as 3-4 SOAs (odds ratio = 2.09, $p < 0.01$), WSQ Higher Certificate (odds ratio= 3.28, $p<0.01$), and WSQ Advanced Certificate (odds ratio = 2.33, $p < 0.01$). For responsibility expansion, the associations are also strong, particularly for 3-4 SOAs (odds ratio = 3.68, $p < 0.001$), WSQ Higher Certificate (odds ratio =3.47, $p<0.01$). WSQ Advanced Certificate (odds ratio = 2.28, $p < 0.05$), and WSQ Certificate (odds ratio= 2.20, $p< 0.05$). This suggests that WSQ outcomes can extend beyond learning into workplace application and broader job scope.

Before accounting for workplace application and responsibility expansion, several WSQ levels are positively associated with reported pay increment, including 3-4 SOAs (odds ratio = 2.83, $p < 0.05$), WSQ Certificate (odds ratio= 3.71, $p<0.01$), WSQ Higher Certificate (odds ratio = 3.97, $p < 0.01$), WSQ Advanced Certificate (odds ratio = 2.69, $p < 0.05$), WSQ Diploma (odds ratio = 2.88, $p < 0.05$), and WSQ Specialist/ Graduate Diploma (odds ratio = 6.82, $p < 0.001$). However, later models (M5-M7) show that pay is more strongly associated with performance improvement and responsibility expansion than with technical skills improvement alone. This suggests that WSQ-related skills gains are more likely to become pay-relevant when they are applied at work, reflected in improved performance, or recognised through expanded responsibilities.

Overall, RQ1 shows that WSQ is significantly associated with capability formation, while performance improvement and responsibility expansion function as important conversion outcomes. Pay increments appear to be a more selective workplace outcome, depending less on WSQ participation alone and more on whether WSQ-related skills are translated into workplace performance and broader job scope.

RQ2: Through what pathways does WSQ translate into workplace and career outcomes?

The evidence indicates that WSQ-related pay effects are largely indirect, operating through the workplace pathways, rather than through direct credential effects alone. Specifically, pay increments are most strongly associated with a pathway in which WSQ builds capability, which is realised when learners report performance improvements (skills utilisation) and/or experience responsibility expansion (talent management/job scope decisions). Residual pay effects consistent with signalling (credential recognition beyond SU/TM) appear more limited and concentrated (i.e., not system-wide), suggesting that signalling is not the dominant pathway for most participants compared with workplace mechanisms.

In M5, performance improvement shows a very strong association with reported pay increments after technical skills improvement is included (odds ratio = 23.14, $p < 0.01$). By contrast, technical skills improvement is not statistically significant (odds ratio = 0.65, $p = 0.32$). This suggests that skills gains are more likely to become pay-relevant when they are reflected in improved job performance, rather than through technical skills improvement alone.

In M6, responsibility expansion is also strongly associated with reported pay increments (odds ratio = 43.12, $p < 0.01$). This suggests that pay outcomes are closely related to whether employers convert WSQ-related capability into broader job scope or additional responsibilities.

In the fully adjusted model, M7, both responsibility expansion and performance improvement remain strongly associated with reported pay increments. Responsibility expansion shows the larger association (odds ratio = 23.39, $p < 0.01$), followed by performance improvement (odds ratio = 8.92, $p < 0.01$). Technical skills improvement remains not statistically significant (odds ratio = 0.56, $p = 0.25$). These findings support the interpretation that WSQ-pay outcomes operate mainly through workplace application and role expansion pathways.

RQ3:

How do outcomes vary by WSQ exposure (e.g., SOAs accumulation vs full qualification levels)?

How does WSQ compare with non-WSQ job-related training intensity?

RQ3 is addressed by examining two related but distinct measures of WSQ exposure: SOA accumulation and full qualification attainment. SOA accumulation and full qualification attainment are analysed separately because they capture different aspect of WSQ exposure. Full

qualifications are typically built from SOAs, so the two measures are not mutually exclusive. SOA accumulation captures modular progression and training depth, while full qualification level captures recognised credential attainment. For this reason, the analysis does not directly compare "SOA holders" against full qualification holders" as separate groups. Instead, it examines how outcomes vary across SOA bands and, separately, across highest reported WSQ qualification tiers.

The first part of the analysis examines how outcomes vary across highest reported WSQ qualification tiers. The second part examines how outcomes vary by SOA accumulation and compares this pattern with non-WSQ job-related training intensity.

First, outcomes vary by the extent of SOA accumulation. Compared with the 1-2 SOA reference group, higher SOA bands generally show stronger associations with reported skills improvement. The association becomes statistically significant from 5-7 SOAs onwards: 5-7 SOAs (odds ratio = 1.90, $p = 0.01$), 8-10 SOAs (odds ratio = 2.40, $p < 0.01$), and more than 10 SOAs (odds ratio = 3.22, $p < 0.01$). This suggests a graded pattern for skills gains, where greater SOA accumulation is associated with higher likelihood of reported skills improvement.

The pattern also extends to workplace outcomes, although it is not strictly linear across all SOA bands. For performance improvement, significant positive associations are observed for 3-4 SOAs (odds ratio = 1.86, $p = 0.02$), 5-7 SOAs (odds ratio = 2.24, $p < 0.01$), and more than 10 SOAs (odds ratio=1.86, $p<0.01$). For additional responsibility, significant positive associations are found for 3-4 SOAs (odds ratio = 2.96, $p < 0.001$), and more than 10 SOAs (odds ratio = 2.59, $p < 0.001$). For additional responsibility, significant positive associations are found for 3-4 SOAs (odds ratio = 2.96, $p < 0.01$), 5-7 SOAs (odds ratio = 2.67, $p < 0.001$), and more than 10 SOAs (odds ratio= 2.96, $p<0.01$). Pay increment are more selective, with significant associations for 5-7 SOAs (odds ratio = 2.57, $p = 0.02$) and more than 10 SOAs (odds ratio=4.72, $p<0.01$).

Second, outcome also vary across full qualifications tiers, which are analysed separately from SOA accumulation. Full qualifications tiers should not be treated as equivalent to the 5-7, 8-10 or more than 10 SOA bands. The qualification-tier analysis shows that full qualifications are generally associated with positive outcomes, but the strength of association differs by qualification level and outcome domains. This suggests that qualification attainment may carry value, but the relationship is not uniform across all tiers. It value appears to depend on the specific qualification level and whether the credential is linked to workplace application, role expansion or employer recognition.

Third, SOA accumulation shows more consistent positive and statistically significant associations with outcomes than non-WSQ training intensity. None of the non-WSQ intensity categories is significantly associated with performance improvement, additional responsibility or pay increment. This suggests that WSQ exposure is not simply functioning as "more training" but may reflect a more structured progression pathway.

Overall, RQ3 shows that outcomes differ by both the extent and type of WSQ exposure. Greater SOA accumulation is positively associated with skills gains, performance improvement and

responsibility expansion. Full qualification tiers also show positive but uneven associations across outcomes.

Although SOA accumulation is associated with positive outcomes, this does not reduce the importance of full qualifications. Rather, the findings suggest that SOAs and full qualifications play complementary roles within the WSQ system. SOAs provide modular access and allow learners to accumulate skills progressively, which may explain why stronger SOA accumulation is associated with skills, performance and responsibility outcomes. Full qualifications, however, serve a different function: they consolidate modular learning into a recognised credential that may carry clearer value for employer recognition, role progression and labour market signalling.

This distinction is important as SOA accumulation reflects training depth, while full qualification attainment reflects recognised completion of a structured pathway. Full qualifications may therefore matter especially where employers use credentials to guide hiring, job deployment, progression decisions or pay increment. The findings suggest that policy should not treat SOAs and full qualifications as substitutes, but linked components of a progression pathway where SOAs support flexible and incremental upskilling, while full qualifications provide a recognised endpoint that can strengthen portability and workplace recognition.

Compared with non-WSQ training intensity, WSQ SOA accumulation appears more consistently associated with reported workplace outcomes, although further research is needed to determine whether this reflects WSQ structure, training content, sector context or learner profile differences.

RQ4:

How do sector and organisational conditions shape the translation of WSQ into performance, progression, and pay?

What implementation and policy levers can strengthen WSQ value realisation?

What challenges do educational institutions, employers, and learners encounter under the WSQ programme?

RQ4 examines how sectoral, organisational and implementation conditions shape the translation of WSQ training into workplace outcomes. The findings suggest that WSQ value realisation depends not only on training participation or credential attainment, but also on whether workplaces provide opportunities to apply skills, recognise improve capability, and link WSQ to job scope, progression or pay.

First, sector and organisational conditions shape the translation of WSQ into performance, progression and pay. Skills gains are relatively similar across sectors (70% vs 66%), but the gap widens for workplace outcomes. Respondents in WSQ-required sectors report stronger workplace outcomes than those in non-WSQ required sectors, particularly for responsibility expansion (31% vs 18%) and pay increment (18% vs 9%).This suggests that where WSQ is more embedded in sectoral

requirements, job roles or progression structures, training is more likely to be converted into workplace recognition.

Workplace and delivery conditions meaningfully shape whether training converts into outcomes. Factors consistent with transfer climate and job design (e.g., opportunities to apply learning, supervisory support, workflow fit, and scope to take on expanded tasks) appear to enable or constrain the conversion from skills gains to performance and responsibility outcomes. Job factors such as autonomy, decision-making, job complexity and continuous training requirements are generally associated with stronger performance improvement and responsibility expansion. There conditions may provide workers with more opportunities to apply newly acquired skills, exercise judgement and take on broader work responsibilities.

By contrast, more repetitive jobs appear less conducive to this conversion process. In such roles, workers may have fewer opportunities to apply new skills in ways that are visible to employers or that lead to expanded responsibilities and pay increment. These findings suggest that WSQ outcomes depend not only on training participation or credential attainment, but also on whether the job provides sufficient scope for skills utilisation and role expansion.

Second, several implementation and policy levels can strengthen WSQ value realisation. The findings point to the importance of moving beyond training completion towards workplace application. This includes strengthening post-training application support, encouraging supervisors to discuss how learning will be used at work, and helping employers link WSQ attainment to job deployment, role design, performance management or progression decisions. WSQ value is likely to be stronger where employers treat training as part of a broader workforce development strategy rather than as a standalone compliance or skills-upgrading activity.

Policy levers could therefore focus on strengthening the “conversion conditions” around WSQ. These include supporting employer-led contextualisation, developing sector-specific progression maps, encouraging recognition of SOA accumulation and full qualifications in HR systems, and providing toolkits for supervisors and employers to translate training into workplace application. For SMEs, pooled cohorts, sectoral guidance and shared implementation resources may help reduce the burden of customisation.

Third, educational institutions, employers and learners face different implementation challenges under WSQ policy. Training providers face the challenge of balancing standardisation and customisation. While standardised WSQ delivery supports quality assurance and portability, employers often value contextualised training that is specific to job tasks, sector needs and workplace practices. This creates a tension between maintaining national consistency and ensuring workplace relevance.

Overall RQ4 shows that WSQ value realisation is shaped by various conditions. Sector institutionalisation, supportive job design, employer integration and contextualised delivery appear to enable conversion from skills to performance, progression and pay. Conversely, repetitive work,

weak post-training application, limited employer recognition and provider customisation constraints may limit outcomes.

Findings Summary

Taken together, the evaluation findings converge on a consistent mechanism: WSQ generates the strongest value when (i) learners engage deeply enough to build meaningful capability, and (ii) workplaces and delivery systems enable those capabilities to be applied, recognised, and rewarded. Learner-side models show that pay gains arise primarily through two pathways—improved performance (skills utilisation) and expanded responsibilities (talent management)—rather than through skills gains alone. Employee interviews corroborate this by showing that WSQ is often perceived as practical and job-relevant, but that realised impact depends on whether workers have opportunities to apply learning and whether supervisors and organisations formally recognise it.

These findings should be read alongside the earlier MTI study on WSQ wage returns. The MTI study found positive wage return to WSQ training, with higher returns for full qualifications than SOAs. Specifically, SOA trainees experienced real wages that were 0.8% higher on average than their control group in the year after training, while full qualification trainees experienced a real wage premium of 5.8% (Ministry of Trade and Industry, 2019).

The present evaluation does not directly replicate the MTI analysis, as it uses survey-based, self-reported pay outcomes rather than administrative wage records and does not estimate treatment effects against a matched control group. Instead, it examines how reported pay increments are associated with WSQ attainment, performance improvement and responsibility expansion. Seen in this light, the findings are complementary, while the MTI study provides evidence of overall wage returns to WSQ training, the present evaluation suggests that such pay outcomes are more clearly associated with workplace translation mechanisms, particularly improved performance and expanded responsibilities.Employer evidence explains why these enabling conditions vary. The interview archetypes and Ward-linkage clusters consistently differentiate employers who embed WSQ into progression systems (talent management) from those who treat WSQ as capability-building without systematic HR integration (performance-oriented) and those who remain disengaged or compliance-driven. These organisational orientations shape whether training is translated into role assignment, progression decisions, and rewards—consistent with the finding that recognition mechanisms are critical for converting training into performance, responsibility, and pay outcomes.

Training provider interviews add an important system-level explanation for why contextualisation—and therefore workplace relevance—can be uneven even when demand exists. Providers described how WSQ standardisation requirements and funding constraints create volume thresholds that make intensive co-creation economically viable mainly for large employers or repeated cohorts. As a result, SMEs and one-off requests are more likely to receive generic delivery, limiting the extent to which training can be tailored to job realities that support skills utilisation and performance impact.

Overall, the integrated evidence suggests that WSQ effectiveness is best understood as a value realisation problem rather than a training quality problem alone: skills can be built, but outcomes depend on whether (a) learners progress sufficiently, (b) employers create utilisation and progression mechanisms, and (c) providers can operationally deliver contextualised training within existing funding and standardisation constraints. These implications inform the recommendations, which focus on strengthening progression depth, improving employer-side recognition and job redesign, and enabling more scalable contextualisation, especially for SMEs.

Recommendations and implications for policy and practice

This section translates the empirical findings into a small set of systemic recommendations. Across the learner models (M1–M7) and the triangulated qualitative evidence, WSQ outcomes are realised most consistently when learning is converted into workplace performance (skills utilisation) and when employers recognise capability through role design (talent management). Employer evidence further suggests that value realisation is uneven: some employers are ready to invest more when the value proposition is clearer and operationally relevant, while others require basic enablement to reduce misalignment and under-utilisation. Finally, training provider evidence indicates a structural constraint, standardisation vs contextualisation, that limits workplace fit, particularly for SMEs and one-off cohorts. The recommendations below respond directly to these dynamics.

Skills realisation: make conversion into workplace value a system default

Skills gains do not automatically translate into productivity-relevant outcomes. Learner results show that downstream outcomes depend on whether learning is applied and becomes visible in performance and role outcomes. Employer findings reinforce that the value proposition is clearest when training links to operational outcomes, and that some employers are willing to invest more when WSQ is demonstrably relevant and implementable at the workplace. Employer interviews suggest that where WSQ is clearly linked to operational outcomes, firms see a stronger value proposition and are more willing to invest and follow through; where relevance is unclear, utilisation tends to be weaker and training impact remains latent.

Recommendations

1. **Embed an "apply-at-work" as a standard part of WSQ participation.** Encourage (or require, where appropriate) a short learner-supervisor plan that identifies: (i) one work task/workflow for application, (ii) what improved performance looks like, and (iii) a review checkpoint within 4–8 weeks.

2. **Support supervisors as the critical enablers of utilisation.** Provide simple supervisor toolkits (task assignment prompts, coaching questions, barrier checklist) so practice opportunities are created intentionally, especially in SOP-bound roles.

3. **Make application visible through work outputs.** Encourage training designs that produce job-relevant outputs (e.g., operational checklists, process improvements, customer handling simulations, digital workflow artefacts), so application is visible and easier for employers to recognise.

4. **Incentivise utilisation supports for SMEs.** SMEs face greater constraints in releasing staff, redesigning tasks, and implementing follow-up coaching. Consider targeted support mechanisms (e.g., shared mentoring, sector facilitators, or structured workplace project templates) to increase the feasibility of skills utilisation practices.

Cluster-specific emphasis

- **Disengaged employers:** focus on minimum viable utilisation (ready-to-use templates, low-effort supervisor prompts, pooled cohorts with built-in assignments).
- **Performance-oriented employers:** focus on operationalising utilisation (supervisor toolkits + post-training checkpoints + work-output evidence as standard practice).
- **Talent management employers:** focus on scaling and standardising strong practices (utilisation routines embedded into development conversations and deployment decisions).

Talent management coupling: move employers up the maturity curve using education plus incentives/support

Assigning additional responsibility is a strong and consistent pathway to pay outcomes. Employer segmentation indicates that not all firms will respond to the same lever: some require education to surface misalignment and under-utilisation, while others, already performance-oriented, need support and incentives to embed WSQ into routine HR/talent processes.

Recommendations

Track A: Education and minimum viable coupling (primarily Disengaged employers)

- *Make misalignment visible. Provide simple diagnostics that show the gap between training attendance and workplace application (e.g., utilisation check results, common blockers, what "good application" looks like).*
- *Start with one defined recognition action. Require/encourage a single post-training action that signals recognition (e.g., expanded tasks, acting duty trial, specialist task allocation) without requiring full HR redesign.*

Track B: Incentives and implementation support (primarily Performance-oriented employers; deepen for Talent management employers)

Embed WSQ into routine HR processes for priority roles. Encourage employers to reference WSQ/SOA bundles in at least one of: (i) role profiles, (ii) competency

expectations, (iii) performance and development conversations, or (iv) advancement criteria, so WSQ becomes a practical input to talent decisions, not just training records.

Recognise modular progression (SOAs) through defined "recognition points." Enable intermediate SOA milestones to trigger clear actions (expanded scope, acting responsibilities, mentoring duties, deployment to higher-value tasks), not only full qualification thresholds.

Incentivise "use" not only "training." Pilot support mechanisms that reward employers for using WSQ/SOA bundles in deployment and progression decisions (e.g., co-funded implementation supports tied to utilisation and role-expansion indicators).

Cluster-specific emphasis.

- **Disengaged employers:** prioritise education & minimum viable coupling (diagnostics + one recognition action linked to training).
- **Performance-oriented employers:** prioritise incentives/support to embed WSQ into deployment and progression practices (role maps, SOA recognition points, implementation toolkits).
- **Talent management employers:** codify and disseminate progression ladders and role-based roadmaps; serve as exemplars for sector adoption.

Deeper contextualisation through employer-anchored delivery models (beyond traditional WSQ TPs)

Training providers report a persistent standardisation–contextualisation tension, and employer interviews reinforce this: even operationally strong employers often need to run additional in-house training after WSQ, pointing to a real contextualisation gap and limited flexibility in current arrangements. To close this gap at scale, without weakening WSQ standards, contextualisation should be anchored more directly in workplace reality through employer-led delivery models, with appropriate assurance and credentialing support. The key shift is to treat credible employers with delivery capability as a contextualisation anchor because they sit in operational reality, while the assurance layer protects WSQ standards.

Recommendations

Employer-led contextualisation (Employer–Provider-led)

Enable organisations that operate in the sector and have strong delivery capability to deliver and shape WSQ training around authentic workflows, tools, and performance standards. In this model, employers anchor:

real job tasks and scenarios,

workplace tools/systems,

work-output evidence that reflects "what good looks like" on the ground.

System support should focus on safeguarding standards through clear outcomes mapping, assessor requirements, and moderation/audit.

Employer–institution partnership (workplace-anchored, institution-supported)

Where employers have strong operational contexts but benefit from education expertise, enable partnerships where:

the employer anchors workplace learning (authentic tasks, work rotations, supervisors as coaches, real evidence of competence), while

the institutional partner strengthens learning design and assurance (pedagogy support, assessment design, moderation/calibration, documentation, and credentialing processes).

This model is especially suitable when contextualisation is deep (e.g., high workplace specificity) and when consistent assessment evidence needs to be packaged for wider adoption.

Guardrails to protect quality while enabling flexibility

To enable contextualisation without diluting WSQ quality, specify what can and cannot vary:

Can flex: scenarios/case materials, sequencing to match work rhythms, tools/software used, workplace artefacts and job outputs used as evidence, role-specific task variants.

Must remain fixed: competency outcomes, minimum evidence thresholds, assessor requirements, moderation and audit rules.

Scale mechanism

Build a pipeline of employer anchors across sectors by identifying credible employer–providers and partnership-ready employers.

Require each model to produce reusable contextualised evidence packs (authentic scenarios and job-output exemplars mapped to WSQ outcomes).

Curate these into sector contextualisation packs and role-based SOA bundles that can be reused for SMEs and pooled cohorts, reducing the need for bespoke redesign.

Cluster-specific emphasis

Disengaged employers: Use employer-anchored models mainly as a relevance and confidence builder. Offer “off-the-shelf” sector contextualisation packs and short pilots (authentic scenarios and job-output evidence) to demonstrate fit and reduce perceived mismatch, without requiring these employers to co-design or invest heavily upfront.

Performance-oriented employers: Prioritise them for Employer–institution partnership pilots. They tend to have clear operational needs and can benefit from institution support to translate workplace practice into structured learning design and assessable evidence. Pair pilots with light implementation supports (apply-at-work routines, supervisor toolkits) so contextualised training translates into observable performance gains.

Talent management employers: Position them as anchor partners to scale the model. Use them to co-develop and validate contextualised evidence packs and role-based SOA bundles, and to demonstrate how contextualised WSQ can be linked to deployment and progression practices. Codify their approaches into sector resources for wider adoption.

Monitoring and evaluation implications: measure progression and value realisation, not only participation

The evaluation shows that training effectiveness is not captured fully by training volume. SOA accumulation and organisational recognition mechanisms are stronger predictors of workplace outcomes than non-WSQ training intensity. This implies that monitoring should track indicators that reflect both progression depth and value realisation.

Recommendations

> *Track SOA accumulation bands as a core effectiveness indicator. Move beyond binary participation measures to include progression depth as part of reporting and evaluation.*
>
> *Include utilisation and recognition indicators in future evaluations. Consider adding measures of (i) opportunities to apply learning, (ii) supervisor support, (iii) role changes, and (iv) progression mechanisms tied to WSQ. These indicators directly align with the SU and TM pathways supported by the findings.*
>
> *Use employer segmentation to target interventions and track movement across segments. Track whether interventions shift employers from disengaged to performance-oriented, and from performance-oriented to talent management integration—providing a measurable pathway for system improvement.*

Overall, these recommendations reinforce a central implication: WSQ outcomes depend not only on what is taught, but on whether capability is applied, recognised, and rewarded within workplace systems—and whether WSQ delivery can be contextualised at scale through an employer–provider ecosystem that strengthens the signalling value of alternative credentials.

Limitations and Future Research

This study provides evidence on how WSQ participation is associated with skills gains, performance improvement, responsibility expansion and pay-related outcomes. However, there are limitations that should be noted.

First, the analysis relies primarily on self-reported outcomes, Respondents were asked to report whether WSQ contributed to improvement in skills, job performance additional responsibilities and pay. While this provides useful insight into perceived training outcomes, it does not directly measure objectives changes in productivity, job scope or wages.

Second, the survey is cross-sectional. As such, the findings should be interpreted as associations rather than causal effects. The stepwise models help identify possible workplace mechanisms through which WSQ may be linked to workplace outcomes, but they should not be treated as formal mediation or causal pathway tests.

Third, some subgroup analyses involve uneven sample sizes. This is particularly relevant when comparing SOA accumulation, full qualification tiers, non-WSQ training intensity and sector groups. The findings should therefore be interpreted as indicative patterns rather than precise estimates for every subgroup.

Fourth, SOA accumulation and full qualification attainment are related but not mutually exclusive measures of WSQ exposure. Full qualifications are typically built from SOAs, while SOA accumulation captures modular progression and training depth. For this reason, the study analyses SOA accumulation and full qualification tiers separately rather than treating them as directly comparable groups.

Future research could build on this study in several ways. First, administrative wage and employment data could be used to examine whether self-reported pay increments correspond to actual wage changes over time. Second, longitudinal research could track learners before and after WSQ participation to better understand how skills gains are converted into performance, responsibility expansion and pay outcomes. Third, future studies could compare WSQ and non-WSQ training within similar sectors or course domains, such as Security or IT , to better isolate whether observed differences are due to WSQ structure, course content, sector requirements or learner profiles. Finally, further research could examine employer practices in greater depth to understand how organisations recognise WSQ attainment through job redesign, progression pathway, performance management and pay decisions.

Conclusion

Summary of study and evidence base

This evaluation examined how WSQ training translates into skills gains and downstream workplace outcomes, and why these outcomes vary across learners and employers. The study triangulated evidence from (i) learner survey analyses using a theory-informed model sequence (M1–M7), (ii) employee interviews, (iii) employer survey (including Ward-linkage clustering) and employer interviews, and (iv) training provider interviews. Taken together, the evidence provides a coherent account of WSQ as a system where training value is shaped not only by learning content, but also by workplace utilisation conditions, employer recognition mechanisms, and delivery constraints.

What the findings conclude about "how WSQ works"

Across quantitative and qualitative findings, WSQ outcomes are best explained as a value realisation process rather than a simple training participation effect.

1. **Skills are built, but must be utilised to matter.** WSQ participation is strongly associated with skills improvement, yet downstream outcomes depend on whether learners can apply new skills to improve performance. Employee interviews consistently reinforced that gains are most visible when job contexts and supervisors enable application.

2. **Responsibility expansion is a second, independent route to reward.** In addition to performance translation, additional responsibilities represent a distinct pathway through which training becomes economically meaningful. Employer evidence shows that this route is strongest where firms deliberately embed WSQ into job design and progression decisions.

3. **Credential recognition is uneven and context-dependent.** Any "credential value" beyond performance and responsibility pathways appears concentrated in specific credentials or contexts. More broadly, pay outcomes are largely explained by workplace mechanisms, utilisation and additional responsibility, rather than training participation alone. This implies that stronger signalling will require system levers that make WSQ/SOAs more legible to employers (e.g., role-based SOA bundles and job-anchored evidence), not communications alone.

4. **Employer orientation explains why outcomes vary.** Employer evidence converges on three segments, disengaged, performance-oriented, and talent management, each reflecting a different approach to WSQ adoption. These segments help explain why similar training experiences can lead to different outcomes across firms.

5. **A persistent standardisation-contextualisation constraint limits workplace fit.** Training provider evidence, echoed by employer interviews, highlights a structural tension: even operationally strong employers report having to run additional in-house "top-up" training after WSQ, indicating a contextualisation gap and limited flexibility in current arrangements—especially for SMEs and one-off cohorts..

Contribution to policy and practice

The findings provide actionable implications for various stakeholders:

Shift the focus from participation to value realisation. Strengthen post-training utilisation mechanisms (opportunity, supervisor support, and work-output evidence) to convert learning into performance outcomes.

Couple WSQ to employer talent and deployment systems. Encourage employers to link WSQ/SOA milestones to role scope, task allocation and progression "recognition points," so capability is recognised and rewarded.

Use differentiated levers by employer cluster. Apply education and minimum viable coupling for disengaged employers, implementation support and incentives for performance-oriented employers, and scaling/codification of good practice among talent-management employers.

Scale contextualisation through employer-anchored delivery models. Reframe contextualisation beyond traditional WSQ training providers by enabling employer-led contextualisation and employer–institution partnerships, supported by clear guardrails to preserve WSQ standards.

Strengthen monitoring around progression and realisation. Track SOA accumulation bands alongside utilisation and recognition indicators, and monitor movement across employer segments as an implementation KPI.

Closing statement

Overall, the evaluation indicates that WSQ is most effective when training is substantive, applicable, and recognised, with outcomes amplified where employers embed WSQ into workplace systems and where delivery can be contextualised at scale. The recommendations therefore focus on strengthening the SU and TM conversion mechanisms and on improving employers' recognition through an employer–provider contextualisation ecosystem and role-based SOA bundles.

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Appendix A

Profile of WSQ learners

Profile	%
Gender	
Male	63.9%
Female	36.2%
Age	
21-29	14.5%
30-34	16.0%
35-39	10.6%
40-44	13.2%
45-49	14.5%
50-54	13.1%
55-59	7.8%
60 and above	10.4%
Ethnicity	
Chinese	61.7%
Malay	13.1%
Indian	18.8%
Eurasian	0.6%
Other	5.9%
Highest Qualification	
Lower Secondary & below	2.4%
Upper Secondary	9.8%
Diploma1/JC/ITE	11.4%
Diploma	27.7%
Bachelor and above	48.7%

Job Characteristics of WSQ learners

Job characteristics	%
Employment Status	
Employed	96.6%
Unemployed	3.4%
Occupation	
PME	40.2%
TAP	23.0%
R&F	36.8%
Industry	
Training and Adult Education	6.0%
Business, Finance & Professional Service	7.7%
Consumer Services & Hospitality	8.1%
Digital, Media & Design	9.7%
Engineering Services	15.3%
Health, Social & Community Services	19.6%
Manufacturing & Technical Services	13.1%

Transport & Logistics	8.2%
Urban Environmental & Security Services	10.1%
Others	2.3%
Income	
No income - $1,999	20.8%
$2000 - $2999	19.7%
$3000 - $3999	19.6%
$4,000 - $5,999	22.0%
$6,000 and above	17.9%

Appendix B

Logistic regression M1, M2, M3 and M4

	M1- Skill Improvement		M2- Improvement in performance		M3- Additional responsibility		M4- Pay increment	
	Odds ratio	**P>z**	**Odds ratio**	**P>z**	**Odds ratio**	**P>z**	**Odds ratio**	**P>z**
Full Qualifications (ref:1- 2 SOAs)								
3-4 SOAs	2.45	0.01	2.09	0.02	3.68	0.00	2.83	0.04
WSQ Certificate	2.98	0.00	1.65	0.10	2.20	0.03	3.71	0.01
WSQ Higher Certificate	2.33	0.01	3.28	0.00	3.47	0.00	3.97	0.01
WSQ Advanced Certificate	1.34	0.26	2.33	0.00	2.28	0.02	2.69	0.04
WSQ diploma	1.70	0.03	1.46	0.17	2.52	0.01	2.88	0.03
WSQ Specialist & Graduate Diploma	1.80	0.07	1.54	0.20	1.93	0.12	6.82	0.00
Gender (ref: Male)								
Female	0.94	0.74	0.74	0.12	0.44	0.00	0.65	0.19
age (ref: 40-44)								
Below 30 years old	1.66	0.14	0.41	0.01	0.69	0.36	2.11	0.17
30 to 34 years old	1.44	0.25	0.44	0.01	1.39	0.39	2.05	0.16
35 to 39 years old	1.26	0.50	0.41	0.01	0.53	0.15	1.23	0.71

45 to 49 years old	1.13	0.68	0.70	0.24	0.46	0.07	1.14	0.81
50 to 54 years old	0.86	0.61	0.49	0.03	0.82	0.63	1.23	0.72
55 to 59 years old	0.77	0.46	0.55	0.12	0.97	0.94	1.61	0.48
60 and above	0.96	0.90	0.55	0.09	0.81	0.64	1.81	0.33
Race (ref: Chinese)								
Malay	1.00	0.99	1.40	0.22	1.52	0.20	1.43	0.40
Indian	0.92	0.70	2.40	0.00	1.88	0.02	2.20	0.02
Others	5.04	0.00	4.10	0.00	3.65	0.00	3.64	0.01
Highest Qual (ref: Degree)								
Below diploma	1.16	0.57	1.33	0.31	3.25	0.00	4.41	0.00
Diploma	1.32	0.19	1.31	0.23	1.58	0.11	1.97	0.07
Work Arrangement (ref: Perm contract)								
1 year contract or lesser	1.17	0.59	0.50	0.02	0.64	0.24	0.74	0.53
2 year contract or lesser	1.04	0.87	1.18	0.48	1.20	0.54	1.43	0.33
No contract or verbal contract	1.18	0.52	0.95	0.84	0.91	0.79	0.83	0.70
Own account workers	0.43	0.13	0.07	0.01	1.00		1.00	
Employers	0.86	0.91	2.92	0.39	17.39	0.09	3.88	0.30
Occupation (ref: PMEs)								
TAPs	0.91	0.71	1.04	0.89	0.63	0.12	1.12	0.78

R&Fs	0.59	0.02	0.89	0.64	0.41	0.01	1.10	0.82
Sector (red: nonWSQ required)								
WSQ required sector	1.28	0.24	1.36	0.15	2.25	0.00	1.83	0.05
Firm Size								
10-49	0.90	0.62	1.01	0.97	1.15	0.60	0.97	0.94
50- 199	1.26	0.35	0.88	0.61	0.87	0.66	0.63	0.26
200 or more	1.12	0.69	0.89	0.69	0.70	0.33	0.84	0.70
Income (ref: High income)								
Low income	2.06	0.04	3.79	0.00	3.86	0.00	1.23	0.72
Lower mid	1.55	0.18	3.08	0.00	4.21	0.00	0.98	0.97
Middle income	1.16	0.61	2.11	0.02	2.23	0.04	0.89	0.83
Upper mid	0.94	0.83	1.76	0.06	1.54	0.23	1.13	0.79
Qualification required by job (ref: Below sec)								
Secondary	0.99	0.99	2.90	0.02	0.81	0.69	2.51	0.17
Post secondary	1.10	0.83	1.52	0.43	0.83	0.76	1.05	0.96
Diploma	0.95	0.90	2.24	0.06	1.10	0.85	2.06	0.27
Degree and above	0.70	0.33	2.55	0.03	1.77	0.25	4.28	0.03
Initial training (ref: Less than 1 week)								
Less than 1 month	1.22	0.55	1.81	0.13	2.12	0.13	0.83	0.73

1 month and over, up to 3 months	1.79	0.08	2.28	0.03	1.56	0.36	0.59	0.33
3 months and over, up to 6 months	1.18	0.64	2.33	0.04	2.01	0.18	0.35	0.09
6 months and over, up to 1 year	1.56	0.23	1.26	0.59	1.42	0.51	0.52	0.28
1 year and over	1.54	0.22	2.31	0.04	1.48	0.45	0.34	0.06
Continuous training (ref: Very little)								
A few days	1.17	0.56	1.79	0.08	2.55	0.04	2.83	0.15
More than a few days but less than 2 weeks	2.24	0.00	2.66	0.00	3.14	0.01	3.76	0.06
More than 2 weeks but less than 1 month	2.43	0.00	1.98	0.04	1.34	0.53	2.81	0.16
More than 1 month but less than 2 months	2.83	0.00	2.25	0.02	2.89	0.02	4.46	0.03
More than 2 months	3.02	0.00	1.92	0.05	3.32	0.01	8.56	0.00
Repetitive work (ref: work not repetitive)								
work often repetitive	0.88	0.58	0.75	0.23	0.70	0.23	1.25	0.54
Task variety (ref: low)								
Perform wide range of tasks at work	1.00	0.99	1.34	0.16	1.39	0.18	0.93	0.82

Autonomy (ref: Low)								
High level of autonomy	1.41	0.09	1.91	0.00	1.29	0.29	1.46	0.23
Decision making (ref: Low)								
High level decision making	1.66	0.01	1.92	0.00	3.01	0.00	2.36	0.01
Job intensity (ref: Low)								
High level of intensity	1.06	0.77	0.87	0.50	1.27	0.33	0.94	0.85
Job complex (ref: Low)								
High level of complexity	1.14	0.51	1.00	1.00	1.71	0.02	1.77	0.07
Safety at work (ref: High)								
Low level of safety	0.78	0.16	1.39	0.07	1.54	0.05	1.47	0.18
_cons	0.30	0.04	0.01	0.00	0.00	0.00	0.00	0.00
Pseudo R2	0.12		0.17		0.25		0.22	

	M5- With Skills & performance improvement		**M6- Additional responsibility**		**M7- (M5+M6)**	
Pay increment	**Odds ratio**	**P>z**	**Odds ratio**	**P>z**	**Odds ratio**	**P>z**
Full Qualifications (ref:1- 2 SOAs)						
3-4 SOAs	1.49	0.51	1.24	0.74	0.79	0.73

WSQ Certificate	4.16	0.01	3.23	0.05	3.41	0.06
WSQ Higher Certificate	2.30	0.17	2.40	0.18	1.68	0.45
WSQ Advanced Certificate	1.90	0.25	2.34	0.15	1.79	0.36
WSQ diploma	2.93	0.05	1.97	0.24	2.22	0.20
WSQ Specialist & Graduate Diploma	6.24	0.00	6.43	0.00	6.02	0.01
Technical skills have improved	0.65	0.32			0.56	0.25
performance has improved	23.14	0.00			8.92	0.00
Responsibility has increased			43.12	0.00	23.39	0.00
Gender (ref: Male)						
Female	0.82	0.60	1.16	0.73	1.15	0.75
age (ref: 40- 44)						
Below 30 years old	4.99	0.01	3.21	0.08	5.61	0.02
30 to 34 years old	3.83	0.03	1.33	0.65	2.79	0.13
35 to 39 years old	2.17	0.22	2.45	0.19	4.62	0.04
45 to 49 years old	1.33	0.63	2.23	0.22	2.88	0.12
50 to 54 years old	1.81	0.36	1.38	0.64	2.09	0.32
55 to 59 years old	2.02	0.34	1.98	0.39	2.92	0.20
60 and above	2.17	0.25	1.76	0.44	2.37	0.26
Race (ref: Chinese)						
Malay	1.11	0.83	1.20	0.71	0.98	0.97
Indian	1.51	0.31	1.76	0.21	1.31	0.57
Others	2.03	0.22	2.00	0.27	1.24	0.75

Highest Qual (ref: Degree)						
Below diploma	5.58	0.00	2.54	0.08	3.10	0.05
Diploma	2.31	0.05	1.48	0.40	1.47	0.44
Work Arrangement (ref: Perm contract)						
1 year contract or lesser	1.01	0.99	0.72	0.58	0.79	0.71
2 year contract or lesser	1.24	0.61	1.07	0.88	1.01	0.99
No contract or verbal contract	0.83	0.74	0.68	0.50	0.52	0.30
Own account workers	1.00		1.00		1.00	
Employers	2.74	0.49	1.13	0.93	0.81	0.89
Occupation (ref: PMEs)						
TAPs	1.42	0.43	2.48	0.07	2.61	0.07
R&Fs	1.35	0.52	2.46	0.08	2.46	0.10
Sector (ref: non-WSQ required sector)						
WSQ required sector	1.64	0.16	1.32	0.47	1.26	0.57
Firm Size						
10-49	1.08	0.85	0.81	0.61	0.85	0.71
50- 199	0.85	0.73	0.52	0.20	0.73	0.56
200 or more	0.93	0.89	1.02	0.98	1.06	0.93
Income (ref: High income)						
Low income	0.66	0.53	0.76	0.70	0.67	0.59

Lower mid	0.50	0.28	0.40	0.18	0.36	0.15
Middle income	0.55	0.32	0.65	0.50	0.48	0.28
Upper mid	0.86	0.78	1.20	0.76	1.04	0.96
Qualification required by job (ref: Below sec)						
Secondary	1.04	0.96	2.16	0.33	1.63	0.57
Post secondary	0.68	0.68	0.75	0.77	0.63	0.66
Diploma	1.13	0.88	1.75	0.48	1.96	0.44
Degree and above	2.78	0.18	3.19	0.14	3.23	0.18
Initial training (ref: Less than 1 week)						
Less than 1 month	0.51	0.29	0.26	0.04	0.20	0.03
1 month and over, up to 3 months	0.34	0.08	0.23	0.03	0.18	0.02
3 months and over, up to 6 months	0.16	0.01	0.10	0.00	0.08	0.00
6 months and over, up to 1 year	0.40	0.20	0.22	0.04	0.17	0.03
1 year and over	0.16	0.01	0.14	0.01	0.10	0.00
Continuous training (ref: Very little)						
A few days	1.71	0.50	2.25	0.35	1.61	0.59
More than a few days but less than 2 weeks	2.26	0.29	3.57	0.13	2.29	0.33
More than 2 weeks but less than 1 month	2.11	0.35	4.64	0.08	3.14	0.20
More than 1 month but less than 2 months	3.46	0.11	5.62	0.04	4.93	0.06
More than 2 months	7.73	0.01	9.77	0.01	8.96	0.01

Repetitive work (ref: work not repetitive)						
work often repetitive	1.61	0.24	2.08	0.10	2.58	0.05
Task variety (ref: low)						
Perform wide range of tasks at work	0.68	0.28	0.57	0.16	0.55	0.16
Autonomy (ref: Low)						
High level of autonomy	1.03	0.93	1.28	0.53	1.06	0.88
Decision making (ref: Low)						
High level decision making	2.00	0.05	1.47	0.32	1.31	0.52
Job intensity (ref: Low)						
High level of intensity	1.14	0.72	0.86	0.72	1.00	1.00
Job complex (ref: Low)						
High level of complexity	1.98	0.05	1.18	0.66	1.33	0.48
Safetey at work (ref: Low)						
High level of safety	1.22	0.54	1.37	0.36	1.11	0.78
_cons	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R2	**0.37**		**0.44**		**0.49**	

Appendix C

WSQ Employee Survey

Question	Response Options
How long, in total, have you been working for this current employer?	Open text response
Do you supervise other employees?	Yes, No
Do you have other managerial duties?	Yes, No
What WSQ levels do you have?	WSQ Certificate, WSQ Higher Certificate, WSQ Advanced Certificate, WSQ Diploma, WSQ Specialist Diploma, WSQ Graduate Diploma
How many Statement of Attainment (SOAs) did you obtain?	Open text response
Have you observed any changes in your following skills since the completion of the WSQ training/programme? *Technical skills* *Thinking critically* *Interacting with other* *Effectively managing self and paying close attention to trends that impact work and living*	Decline, No Change, Improve
To what extent has the WSQ training improved your performance in your current job role?	Not at all, A little, To some extent, Quite a lot, A great deal
To what extent has the WSQ training contributed to a pay increment in your current job role?	Not at all, A little, To some extent, Quite a lot, A great deal
To what extent has the WSQ training contributed to you taken on any additional responsibilities?	Not at all, A little, To some extent, Quite a lot, A great deal
How widely recognised are WSQ credentials as a mark of competence within your industry?	Not Recognised, Slightly Recognised, Somewhat Recognised, Widely Recognised
Would you say that the WSQ training has improved your skills?	A lot, A little, Not at all
Are you able to make use these skill improvements in your current job?	Yes, No
How long did it take for you, after you first started doing this type of job, to learn to do it well?	Less than 1 week, Less than 1 month, 1 month and over, up to 3 months, 3 months and over, up to 6 months, 6 months and over, up to 1 year, 1 year and over, up to 2 years, 2 years and over
How much continuous learning is normally expected in your job every year?	Very little or negligible, A few days, More than a few days but less than 2 weeks, More than 2 weeks but less than 1 month, More than 1 month but less than 2 months, More than 2 months but less than 3 months, More than 3 months

How often does your work involve carrying out short, repetitive tasks?	Never, Rarely, Sometimes, Often, Always
To what extent does your job require the performance of a wide range of tasks?	Not at all, A little, To some extent, Quite a lot, A great deal
My job allows me to take part in making decisions that affect my work.	Not at all true, Slightly True, Somewhat True, True, Very True
How often does your work involve…? *Working at very high speed* *Working to tight deadlines* *Working extra time over and above the formal hours of your job*	Never, Rarely, Sometimes, Often, Always
How much influence do you personally have on…? *Deciding how hard you work* *Deciding what tasks you are to do* *Deciding how you are to do the task* *Deciding the quality standards to which you work*	None at all, A little, A moderate amount, A lot, A great deal
In your job, how often are you confronted with new or complex problems that take at least 30 minutes to find a good solution? Only consider the time needed to THINK of a solution, not the time needed to carry it out.	Never, Less than once a week, Once a week, Two to five times a week, More than five times a week
To what extent does your job expose you to risk of sickness or injury?	Not at all, A little, To some extent, Quite a lot, A great deal

WSQ Employer Survey

Question	**Response Options**
As of today, approximately how many staff members are working at your establishment?	<10, 10 – 49, 50 – 99, 100 – 199, >200
Please approximate the percentage or number of these staff members who fall into the following categories. *Managers* *Professionals* *Technicians and associate professionals* *Rank and File*	Percentage

Please approximate the percentage or number of these staff members who fall into the following categories. *A bachelor's degree or higher* *A diploma* *A professional/vocational certificate* *Less than a diploma or certificate*	Percentage
Please approximate the percentage or number of these staff members who fall into the following categories. *Induction training of more than a week* *Frequent learning/development activities* *At least 3 years industry-relevant experience*	Percentage
Please rate the following statements using a 5-point scale, *Compared to others in your industry, there was a substantial amount of customisation depending on the requirements of customers or users of your services* *Compared to others in your industry, the competitive success of your establishment's products or services is wholly dependent on price* *You compete in a market for premium quality products or services* *This establishment relies on developing unique products or services.*	Strongly disagree, Disagree, Neutral, Agree, Strongly agree
To what extent is your workplace organised in the following way?	Not at all, A little, To some extent, Quite a lot, To a great extent

Employees have a great deal of discretion over how they do their work *Employees have a great deal of discretion over the quality of their output* *Employees have a great deal of discretion over what tasks they are to do*	
Please approximate the percentage of your establishment's current employees, *Who are adding significant value to your business* *Who would you consider as high potential*	Percentage
To what extent is the following information shared with non-managerial employees in your establishment? *Financial information* *Business plans* *Operational challenges*	No one at all, Some employees, Everyone
How well does the WSQ programme cater to the specific skill needs of your industry compared to non-WSQ credentials offered by industry associations or professional bodies?	Much worse, Somewhat worse, About the same, Somewhat better, Much better

In general, have you observed any changes in your **Managers and Professionals** since the completion of the WSQ training? *Thinking critically* *Interacting with other* *Effectively managing self and paying close attention to trends that impact work and living* *Technical skills*	Decline, No Change, Improve, Do not know/did not evaluate employees
In general, have you observed any changes in your **technicians** since the completion of the WSQ training? *Thinking critically* *Interacting with other* *Effectively managing self and paying close attention to trends that impact work and living* *Technical skills*	Decline, No Change, Improve, Do not know/did not evaluate employees
In general, have you observed any changes in your **Rank and File** since the completion of the WSQ training? *Thinking critically* *Interacting with other* *Effectively managing self and paying close attention to trends that impact work and living* *Technical skills*	Decline, No Change, Improve, Do not know/did not evaluate employees
To what extent do you agree that the following qualifications/certificates prepare employees for the skills and knowledge required in their job roles? *WSQ Full Qualification* *Academic qualification*	Strongly disagree, Disagree, Neutral, Agree, Strongly agree
When promoting employees to supervisory or managerial position, to what extent do the following demonstrate and employee's	Not at all, A little, To some extent, Quite a lot, A great deal

readiness for the increased responsibilities of the role: *WSQ Full Qualification* *Academic qualification* *Work experience* *Work performance* *Level of technical skills*	
To what extent do WSQ programmes help you identify training needs for your employees?	Not at all, A little, To some extent, Quite a lot, A great deal
To what extent do you agree that WSQ provides support for employers to create their own training programmes to be used in their organisation?	Strongly disagree, Disagree, Neutral, Agree, Strongly agree
How effective are WSQ qualifications in ensuring employees acquire the necessary skills for their job roles?	Not effective at all, Slightly effective, Moderately effective, Effective, Highly effective
How well do the skills and competencies covered by specific WSQ qualifications/ certificates align with the actual needs of your organisation for the corresponding job roles? *Technical skills* *Critical Core Skills*	Not aligned at all, Slightly aligned, Moderately aligned, Aligned well, Aligned very well
How often do you encounter instances where an employee with a WSQ qualification lacked the necessary skills for the job?	Never, Rarely, Occasionally, Frequently, Very frequently
Do you agree that the WSQ framework keeps pace with the evolving skills demands in your industry?	Strongly disagree, Disagree, Neutral, Agree, Strongly agree
How well do you believe traditional academic qualifications (e.g. diploma, degree) prepare candidates for roles in your industry?	Not prepared at all, Slightly prepared, Moderately prepared, Well prepared, Very well prepared
How likely are you to hire a candidate with a WSQ qualification for a role traditionally requiring academic qualifications (e.g. diploma, degree), given that they possess the necessary skills?	Very unlikely, Somewhat unlikely, Somewhat likely, Likely, Very likely