INTERNATIONAL JOURNAL OF BUSINESS AND MANAGEMENT (IJBM)
ISSN: 2815-9330 (Online)

VOL. 5, NO. 2 2026 https://iessociety.org/

Beyond skills: Employer-perceived labour substitutability and graduate competitiveness in high-cost labour markets

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Abstract

This paper examines how graduates from high-cost labour markets can remain competitive amid global wage arbitrage, generative AI-enabled task transformation, and cross-border talent substitution. Using Hong Kong as a theoretically significant case, it reframes graduate employability as a problem of cost-adjusted graduate value and employer-perceived labour substitutability rather than skills possession alone. The paper adopts a conceptual and integrative review approach, synthesising literature on graduate employability, graduate capitals, human capital theory, signalling theory, strategic human resource management, global labour arbitrage, and AI-enabled knowledge work. It develops a conceptual model and propositions explaining how high-cost graduates can reduce perceived substitutability and strengthen competitiveness. The paper argues that graduate employability in high-cost labour markets is shaped by employers' assessment of whether graduates generate sufficient value relative to cost, and whether their work can be replaced by lower-cost labour or AI-enabled alternatives. It introduces employer-perceived labour substitutability as the central theoretical mechanism and proposes the VALUE Framework, comprising Verifiable productivity, Adaptive skill stacking, Local-regional market intelligence, Unoutsourceable capabilities, and Employer-relevant signalling, as a substitutability-reduction model. The framework provides actionable guidance for universities, programme leaders, employers, HR managers, and policymakers, emphasising evidence-based value creation, AI-augmented productivity, contextual intelligence, and strategies to reduce perceived substitutability. The paper contributes to graduate employability and management literature by introducing cost-adjusted graduate value and employer-perceived labour substitutability as new theoretical constructs, extending human capital and signalling theory to account for global labour arbitrage and AI-enabled substitution.

***Keywords*:** Graduate Employability, Cost Adjusted Graduate Value, Labour Substitutability, Human Capital Theory, Signalling Theory, Strategic HRM, Artificial Intelligence, Hong Kong

JEL Classification: J24, I23, M51

DOI: https://doi.org/10.56879/ijbm.v5i2.128

1. Introduction

Graduate employability has become a defining concern for universities, employers, students and policymakers. In many advanced economies, the expansion of higher education has increased the number of degree holders entering the labour market, while economic restructuring, technological change and global competition have made career transitions more uncertain. The possession of a degree is no longer sufficient to guarantee meaningful employment or sustained career progression. Employability has therefore become a central objective of higher education policy, curriculum design and institutional performance measurement. Existing graduate employability literature has made important contributions by identifying the skills, attributes, capitals and learning experiences that support graduate labour-market outcomes. Hillage and Pollard (1998) define employability as the capability to gain initial employment, maintain employment and obtain new employment when required. Yorke (2006) conceptualises employability as a set of achievements, understandings, skills and personal attributes that make graduates more likely to gain employment and succeed in their chosen occupations. Knight and Yorke's (2004) USEM model highlights the importance of understanding, skilful practices, efficacy beliefs and metacognition. More recent graduate capital approaches argue that employability depends on multiple forms of capital, including human, social, cultural, identity and psychological capital (Tomlinson, 2017; Clarke, 2018). These perspectives remain highly valuable. However, they do not fully explain how graduates are evaluated when employers can access lower-cost labour across borders, outsource knowledge-based tasks, engage platform workers or use artificial intelligence to perform work previously assigned to junior staff. In contemporary labour markets, graduates compete not only with other local graduates but also with remote workers, offshore teams, freelancers and AI-enabled systems. The employability question is therefore shifting from "Do graduates possess skills?" to "Can graduates create sufficient value to justify their cost when alternative sources of labour and technology are available?"

This shift is particularly important for graduates in high-cost labour markets. In cities such as Hong Kong, Singapore, London, Sydney, Seoul and New York, graduate labour is relatively expensive compared with regional or offshore alternatives. Employers in these cities may still value local graduate talent, but they are increasingly likely to assess whether graduate-level tasks must be performed locally, whether routine work can be automated, and whether lower-cost workers can produce comparable outputs. This creates a distinctive form of employability pressure: the pressure to demonstrate not only competence, but also cost-adjusted value and low substitutability. For work-applied management, this issue matters because graduate employability is not only an educational outcome but also a question of how organisations source, evaluate, develop and retain early-career human capital under conditions of cost pressure and technological change.

Hong Kong provides a theoretically significant context for examining this issue. It is a high-cost, service-oriented and internationally connected economy whose competitiveness depends on

DOI: https://doi.org/10.56879/ijbm.v5i2.128

human capital, professional services, bilingual communication, institutional trust and regional connectivity. At the same time, Hong Kong graduates face increasing competition from regional labour markets, digital platforms, remote work and AI-enabled productivity tools. The city's integration with the Greater Bay Area further expands both opportunity and competition. Hong Kong graduates may possess distinctive advantages in bilingual communication, common law awareness, international business norms and cross-border coordination, but these advantages must be converted into employer-recognised value.

This paper argues that graduate employability in high-cost labour markets should be reframed through a mechanism of cost-adjusted value signalling under perceived labour substitutability. Traditional employability models emphasise skills, attributes, capitals and career readiness (Knight & Yorke, 2004; Yorke, 2006; Tomlinson, 2017; Clarke, 2018). While these remain important, they do not fully address how employers evaluate graduates when comparable labour can be sourced at lower cost or when routine knowledge tasks can be supported by artificial intelligence. Under such conditions, the central question is not only whether graduates possess skills, but whether they can demonstrate value that is sufficiently distinctive, productive and context-specific to reduce employer perceptions of substitutability.

This paper makes three contributions. First, it introduces cost-adjusted graduate value to explain how employers evaluate graduate capability relative to employment cost, productivity expectations and alternative sourcing options. Second, it introduces employer-perceived labour substitutability as the missing mechanism linking global wage arbitrage, generative AI-enabled task transformation and graduate competitiveness. Third, it develops the VALUE Framework as a substitutability-reduction model that explains how high-cost graduates can strengthen competitiveness through verifiable productivity, adaptive skill stacking, local-regional market intelligence, unoutsourceable capabilities and employer-relevant signalling.

The remainder of the paper is structured as follows. Section 2 explains the conceptual and integrative review approach. Section 3 reviews graduate employability and identifies the limitations of skills-based and capital-based approaches under conditions of global labour competition. Section 4 discusses global wage arbitrage, AI transformation and the high-cost graduate problem. Section 5 develops the key theoretical constructs. Section 6 explains why Hong Kong is a theoretically significant case. Section 7 presents the VALUE Framework. Section 8 develops the conceptual model and formal propositions. The final sections discuss implications for universities, employers, HR managers, policymakers and future research.

The central conceptual contribution is therefore a shift from a possession-based view of employability to a value-substitutability view. Whereas traditional employability approaches ask what skills, attributes or capitals graduates possess, this paper asks how employers compare graduate labour against alternative sources of work. Employability in high-cost labour markets is

DOI: https://doi.org/10.56879/ijbm.v5i2.128

therefore reconceptualised as value justification under conditions of perceived labour substitutability.

2. Conceptual and Integrative Review Approach

This paper adopts a conceptual and integrative review approach. Conceptual papers are appropriate when the aim is to clarify an emerging phenomenon, integrate fragmented literature and develop new theoretical or practical frameworks (MacInnis, 2011; Jaakkola, 2020). The issue addressed in this paper is not a single empirical relationship but a complex management and higher education problem at the intersection of graduate employability, global labour competition, strategic human capital, AI-enabled work transformation and high-cost urban labour markets.

Integrative reviews are especially useful when a topic has been discussed across multiple disciplines but lacks a coherent organising framework (Torraco, 2005; Snyder, 2019). Graduate employability has been widely studied in higher education research, while human capital, signalling, outsourcing, automation and talent strategy have been addressed in economics, HRM and management scholarship. These literatures are often treated separately. Higher education literature tends to focus on curriculum, student attributes and graduate outcomes, whereas HRM and management literature focus on productivity, strategic value and organisational performance. This paper integrates these perspectives to explain how graduates in high-cost labour markets can remain competitive when alternative sources of labour and technology are available.

The review draws on six literature domains. The first domain is graduate employability, including definitions, employability models, curriculum integration and graduate attributes (Hillage and Pollard, 1998; Knight and Yorke, 2004; Yorke, 2006; Yorke and Knight, 2006). The second domain is graduate capital theory, which explains employability through human, social, cultural, identity and psychological capital (Tomlinson, 2017; Clarke, 2018). The third domain is human capital and signalling theory, which explains how education, skills and credentials influence productivity and labour-market matching under uncertainty (Becker, 1964; Spence, 1973).

The fourth domain is strategic HRM and the resource-based view, which explain how human capital contributes to organisational advantage when it is valuable, rare, difficult to imitate and effectively organised (Barney, 1991; Wright et al., 1994; Lepak and Snell, 1999; Boxall and Purcell, 2016). The fifth domain concerns globalisation, outsourcing and wage arbitrage, which show how work can be reorganised across locations in response to cost differences and technological coordination (Friedman, 2005; Brown et al., 2011; Baldwin, 2019). The sixth domain is digital transformation and AI-enabled work change, which highlights how technology reshapes tasks, skill demand and early-career work (Autor, 2015; McKinsey Global Institute, 2017; OECD, 2019; World Economic Forum, 2025). The framework was developed through theoretical integration rather than statistical aggregation or exhaustive systematic review, with each construct derived from the intersection of employability theory, strategic human capital logic and contemporary task-substitution pressures.

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This paper does not claim to provide a systematic review of all employability literature. Instead, it develops a theory-informed conceptual synthesis. The purpose is to identify an under-theorised mechanism — perceived labour substitutability — and to explain how high-cost graduates can reduce this perception through value-based capabilities and signalling.

Hong Kong is used as an illustrative but theoretically meaningful case. The paper does not present primary empirical data from Hong Kong. Rather, Hong Kong is used to theorise the high-cost graduate problem because it combines international connectivity, high employment cost, service-sector dependence, common law institutions, bilingual labour-market expectations and Greater Bay Area integration. These contextual features make Hong Kong a useful setting for conceptualising employability pressure in high-cost urban economies. While Hong Kong provides the focal illustrative case, the argument is relevant to other high-cost urban labour markets where graduate labour is exposed to regional wage comparison, remote work and AI-enabled task transformation.

3. Graduate Employability and the Limits of Skills-Based Thinking

Graduate employability is commonly understood as the capacity of graduates to obtain and sustain meaningful employment. Hillage and Pollard (1998) describe employability as the ability to gain employment, remain employed and move between jobs when necessary. Yorke (2006) expands this definition by emphasising achievements, skills, understandings and personal attributes that support career success. These definitions are important because they distinguish employability from employment. A graduate may be employed without being highly employable, and a graduate may be employable even during temporary labour-market difficulties.

Knight and Yorke's (2004) USEM model provides a more developed account of employability by identifying four interrelated components: understanding, skilful practices, efficacy beliefs and metacognition. This model is influential because it avoids reducing employability to technical skills. It recognises that graduates require subject knowledge, practical competence, self-belief and reflective capacity. Yorke and Knight (2006) further argue that employability should be embedded within curricula rather than treated as a peripheral career service.

The graduate capital model further advances the field. Tomlinson (2017) argues that graduates draw on multiple forms of capital when navigating labour markets: human capital, social capital, cultural capital, identity capital and psychological capital. Human capital refers to knowledge and skills. Social capital includes networks and relationships. Cultural capital refers to valued behaviours, norms and symbolic resources. Identity capital concerns graduates' professional self-concept. Psychological capital includes resilience, confidence and adaptability. Clarke (2018) similarly argues that employability should be understood as the interaction between individual attributes, capitals and labour-market context.

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These approaches have significantly improved understanding of graduate employability. They show that employability is not simply the possession of technical skills but a multidimensional and relational phenomenon. However, they remain limited in one important respect: they do not sufficiently theorise how graduates are evaluated under conditions of global labour comparison, wage arbitrage and technological substitution.

Skills-based employability frameworks often assume that if graduates acquire the right skills, they become more employable. Graduate capital models add nuance by showing that social, cultural and identity resources matter. Yet both approaches may understate the employer's cost-value evaluation. In high-cost labour markets, employers do not merely ask whether graduates have skills or capitals. They ask whether those skills and capitals generate value that justifies the cost of local employment.

This distinction is crucial. A graduate may possess communication skills, teamwork skills, digital literacy and problem-solving ability. However, if similar work can be performed by a remote worker, an offshore service provider or an AI-enabled system at lower cost, these skills may not be sufficient to secure competitive advantage. Employability therefore depends not only on capability possession but also on perceived non-substitutability.

This paper does not reject existing employability models. Rather, it extends them by introducing a cost-substitutability lens. Graduate employability in high-cost labour markets should be understood as the ability to demonstrate valuable, distinctive and credible contribution in ways that reduce employer perceptions of replaceability. The graduate's task is not simply to become skilled, but to become worth hiring locally.

4. Global Wage Arbitrage, AI Transformation and the High-Cost Graduate Problem

Global wage arbitrage refers to the use of wage differences across locations to reduce labour costs or access skills more efficiently. Historically, wage arbitrage was associated with manufacturing relocation and business process outsourcing. However, digital technologies have expanded its relevance to professional and knowledge-based work. Friedman (2005) argued that digital connectivity enabled forms of work to be performed across geographical boundaries. Baldwin (2019) extends this argument by suggesting that globalisation increasingly affects services and knowledge work through digital tools, remote collaboration and virtual delivery.

Brown et al. (2011) describe this process as a "global auction", in which educated workers across different economies compete for jobs and opportunities. In such a labour market, credentials alone may not protect workers in high-cost economies. Employers may access skilled labour from lower-cost regions, particularly for tasks that are codifiable, standardised or digitally transferable. This creates pressure on graduates in expensive cities because entry-level professional work often involves tasks that are relatively easy to separate from location.

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Examples include report drafting, basic market research, presentation preparation, data cleaning, translation support, administrative coordination, content development and customer communication. These tasks remain important, but they may not require high-cost local graduate labour if comparable outputs can be obtained elsewhere. As a result, high-cost graduates face what this paper calls the high-cost graduate problem: the need to justify local employment cost when alternative sources of labour and technology are available.

Recent studies on generative AI suggest that AI can significantly alter the productivity and task performance of knowledge workers. Noy and Zhang (2023) find that access to generative AI can improve productivity and output quality in writing-related professional tasks, particularly among lower-performing workers. Brynjolfsson et al. (2023) similarly show that generative AI assistance can increase productivity in customer support work and reduce performance inequality among workers. Dell'Acqua et al. (2023) demonstrate that generative AI can improve performance on tasks within its capability frontier, while also creating risks when workers rely on AI outside that frontier. Eloundou et al. (2024) further argue that large language models may affect a substantial share of occupational tasks, particularly those involving information processing and communication.

These findings are important for graduate employability because many entry-level graduate tasks involve writing, summarising, researching, analysing, communicating and preparing knowledge outputs. Generative AI may therefore increase the substitutability of routine graduate labour while simultaneously increasing the productivity of graduates who know how to use AI responsibly and critically. This reinforces the paper's argument that high-cost graduates must compete not by performing routine tasks alone, but by combining AI-augmented productivity with judgement, contextual intelligence and employer-relevant signalling.

These recent generative AI findings build on a broader literature on automation and task transformation. AI-enabled tools can support writing, coding, translation, research, data analysis, design and administrative workflows. Autor (2015) argues that technological change often substitutes for routine tasks while complementing non-routine analytical, interpersonal and problem-solving work. McKinsey Global Institute (2017) similarly suggests that automation potential varies by task, with predictable and routine tasks more exposed. The OECD (2019) and World Economic Forum (2025) emphasise that workers increasingly need combinations of cognitive, social-emotional, digital and adaptive skills.

For graduates, AI creates both risk and opportunity. The risk is that traditional entry-level tasks may become automated, accelerated or partially replaced. If graduates are valued mainly for summarising information, drafting documents or preparing basic reports, AI can reduce the distinctiveness of their labour. The opportunity is that graduates who can use AI responsibly and strategically may become more productive, analytical and creative. AI therefore raises the

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threshold for graduate value. Employers may expect graduates not only to complete tasks, but to complete them faster, better and with stronger judgement.

In high-cost labour markets, the combined effect of global wage arbitrage and AI transformation is a sharper employer evaluation of graduate labour. Employers may ask: can this work be done offshore? Can it be done by AI? Can it be done by a lower-cost worker using AI? Does the local graduate provide additional value through context, trust, judgement, communication or client understanding? These questions reveal that employability is increasingly mediated by perceived substitutability.

5. Theoretical Constructs

To strengthen the conceptual foundation, this paper introduces three interrelated constructs: cost-adjusted graduate value, employer-perceived labour substitutability and value-based employability signalling. In this paper, graduate competitiveness refers to the relative attractiveness of graduates to employers under conditions of cost comparison, technological substitution and cross-border labour availability. It is treated as a labour-market expression of employability in high-cost contexts.

5.1 Cost-Adjusted Graduate Value

Cost-adjusted graduate value refers to the perceived organisational contribution of a graduate relative to the direct and indirect costs of employing that graduate. Direct costs include salary, benefits and training expenditure. Indirect costs include supervision time, onboarding effort, coordination requirements and the risk associated with uncertain early-career productivity. Human capital theory suggests that education and training increase productivity by enhancing knowledge, skills and capability (Becker, 1964). However, human capital theory does not fully explain how employers compare graduates across different cost environments. In globally connected labour markets, employers evaluate not only whether graduates possess human capital, but whether that human capital produces sufficient value relative to its price. Cost-adjusted graduate value therefore extends human capital theory by incorporating employer cost-value judgement. A graduate in a high-cost labour market may possess strong skills, but if similar outputs can be produced by lower-cost labour or AI-enabled systems, the perceived value of hiring locally may decline. Conversely, if the graduate provides distinctive value through contextual understanding, productivity, stakeholder trust and integrated judgement, the cost may be justified. This construct is especially relevant to high-cost cities. In such contexts, graduates cannot compete sustainably by lowering wages alone. Instead, they must increase perceived value. Cost-adjusted graduate value therefore becomes a central condition of employability.

5.2 Employer-Perceived Labour Substitutability

Employer-perceived labour substitutability refers to the extent to which employers believe that a graduate's tasks, outputs or capabilities can be replaced by alternative sources of labour or

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technology without significant loss of quality, reliability, trust, contextual sensitivity or strategic value. These alternatives may include offshore workers, regional graduates, freelancers, outsourced service providers or AI-enabled systems.

Substitutability is the central theoretical mechanism in this paper. Global wage arbitrage, remote work and AI transformation do not automatically reduce employability. Their effect depends on whether employers perceive graduate work as replaceable. If a graduate's work is routine, codifiable, weakly contextual and easy to monitor, substitutability is likely to be high. If the work involves tacit knowledge, stakeholder interaction, ethical judgement, local-regional intelligence or trust, substitutability is likely to be lower.

This construct connects graduate employability with strategic HRM and the resource-based view. Barney (1991) argues that resources contribute to sustained competitive advantage when they are valuable, rare, difficult to imitate and effectively organised. Wright et al. (1994) apply this logic to human resources, suggesting that human capital can support competitive advantage when employee capabilities are strategically valuable and difficult to replicate. Lepak and Snell (1999) further distinguish human capital by value and uniqueness. If graduate capabilities are low in uniqueness, employers may outsource or automate them. If they are valuable and unique, employers have stronger reasons to invest in them.

Employer-perceived labour substitutability therefore helps explain why some graduates remain competitive despite high labour costs, while others become vulnerable. The issue is not merely possession of skills, but whether employers view those skills as replaceable.

5.3 Distinguishing Employability from Substitutability

A key theoretical distinction in this paper is that employability and substitutability are related but not equivalent constructs. Employability generally refers to a graduate's capacity to obtain, sustain and progress in employment (Hillage and Pollard, 1998; Yorke, 2006). It is typically concerned with the graduate's skills, attributes, capitals, career readiness and ability to navigate labour-market opportunities (Knight and Yorke, 2004; Tomlinson, 2017; Clarke, 2018). By contrast, employer-perceived labour substitutability refers to the employer's judgement regarding whether a graduate's work can be replaced by alternative sources of labour or technology without significant loss of value.

This distinction is important because a graduate may be employable but still highly substitutable. For example, a technically competent graduate coder may possess strong employment-relevant skills, but if similar coding tasks can be performed by offshore developers or AI-assisted tools at lower cost, the graduate's labour may still be perceived as substitutable. Conversely, a graduate with moderate technical skills may be less substitutable if they possess local client knowledge, bilingual communication ability, institutional understanding and trusted stakeholder relationships.

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Therefore, employability concerns the graduate's capacity to participate in employment, whereas substitutability concerns the employer's perception of alternative sourcing options.

This distinction extends graduate employability theory by introducing a comparative employer-evaluation lens. Existing employability models tend to focus on what graduates possess or develop. The concept of substitutability shifts attention to what employers compare. In high-cost labour markets, employer decisions are increasingly shaped not only by graduate capability but also by perceived alternatives: lower-cost workers, outsourced providers, freelancers, remote workers and AI-enabled systems. Therefore, reducing perceived substitutability becomes a strategic condition of graduate competitiveness.

5.4 Value-Based Employability Signalling

Value-based employability signalling refers to the graduate's ability to communicate credible evidence of applied capability, productivity and differentiated contribution to employers. It extends signalling theory by moving beyond the degree as the primary signal of employability. Spence (1973) argues that employers face uncertainty when assessing job applicants and therefore rely on signals to infer productivity. In graduate labour markets, degrees, grades, institutional reputation and internships often function as signals. However, in high-participation higher education systems, the signalling value of degrees may weaken as more people obtain similar qualifications (Marginson, 2016). Employers may require more specific evidence of capability. Value-based employability signalling is particularly important in high-cost labour markets because employers must justify local hiring decisions. A graduate who claims to be hardworking, adaptable or communicative provides weak evidence. A graduate who can show a portfolio, applied project, internship output, AI-assisted analysis, bilingual presentation or measurable contribution provides a stronger signal. Such evidence reduces uncertainty and supports the employer's perception of cost-adjusted value. This construct links individual capability with employer interpretation. Capabilities do not automatically translate into employability unless they are visible, credible and relevant to employer needs. Value-based signalling is therefore a key mechanism through which graduates can reduce perceived substitutability.

6. Hong Kong as a Theoretically Significant Case

Hong Kong is not used in this paper merely as a convenient local example. It represents a theoretically significant case of high-cost graduate employability because it combines several contextual features that intensify the cost-substitutability problem. Hong Kong is theoretically useful because it compresses several pressures into a single labour-market setting: high employment cost, service-sector dependence, bilingual professional norms, common law institutions, GBA integration and exposure to regional labour comparison. These features make it an appropriate context for theorising how high-cost graduates must justify their value under conditions of labour substitutability.

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First, Hong Kong is a high-cost service economy. Its labour market is shaped by finance, logistics, professional services, tourism, education, creative industries, trade and business support services. Many graduate roles are knowledge-based, communication-intensive and client-facing. At the same time, much entry-level work is information-based and therefore potentially transferable across borders. This creates direct pressure on graduates to demonstrate value beyond routine task execution.

Second, Hong Kong operates as an intermediary economy between Mainland China and global markets. Its graduates may possess distinctive value when they can combine international business norms, English-Chinese communication, institutional knowledge and understanding of Mainland-related commercial opportunities. This intermediary role creates local-regional capabilities that are not easily replicated by generic offshore labour.

Third, Hong Kong's common law system, financial infrastructure and professional service environment create demand for trust-based and institutionally aware labour. Graduates who understand these institutional features may contribute value in compliance, client service, risk communication, business development and cross-border coordination. These forms of value are not purely technical; they depend on context, credibility and judgement.

Fourth, Hong Kong's integration with the Greater Bay Area creates both opportunity and competition. The Greater Bay Area expands the market space available to Hong Kong graduates, especially in innovation, entrepreneurship, finance, technology, culture and professional services. However, it also increases comparison with graduates from nearby Mainland cities. Hong Kong graduates must therefore demonstrate regional intelligence and cross-border capability rather than rely solely on local credentials.

These features make Hong Kong useful for theorising high-cost graduate competitiveness. The case illustrates how graduates in expensive urban economies must compete not by becoming cheaper, but by becoming less substitutable. Their competitiveness depends on converting local-regional knowledge, bilingual capability, institutional awareness and AI-augmented productivity into employer-recognised value.

7. The VALUE Framework as a Substitutability-Reduction Model

The VALUE Framework is proposed as a substitutability-reduction model for high-cost graduate competitiveness. It explains how graduates can increase cost-adjusted graduate value and reduce employer-perceived labour substitutability through five complementary mechanisms: Verifiable productivity, Adaptive skill stacking, Local-regional market intelligence, Unoutsourceable capabilities and Employer-relevant signalling.

The framework is not intended as a generic list of employability attributes. Instead, each dimension addresses a specific problem in employer evaluation. Verifiable productivity concerns the graduate's underlying contribution. Adaptive skill stacking concerns the integration of capabilities

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that are difficult to replicate through single-source labour or AI systems. Local-regional market intelligence concerns context-specific value. Unoutsourceable capabilities concern relational, judgement-based and tacit forms of human contribution. Employer-relevant signalling concerns the visibility and credibility of graduate value.

The distinction between productivity and signalling is especially important. Productivity refers to actual value creation, while signalling refers to the communication and verification of that value. A high-cost graduate needs both. Without productivity, signalling becomes superficial self-presentation. Without signalling, productivity may remain invisible to employers.

7.1 Verifiable Productivity

Verifiable productivity refers to the graduate's ability to demonstrate observable or measurable contribution. In high-cost labour markets, employers may be reluctant to rely on vague claims of potential. They need evidence that a graduate can improve efficiency, support decision-making, enhance customer experience, produce quality outputs or contribute to organisational objectives.

This dimension addresses the uncertainty problem identified by signalling theory (Spence, 1973). Employers cannot fully observe future productivity before hiring, so evidence of past applied performance becomes important. Work samples, portfolios, internship outputs, case analyses, data dashboards, marketing reports and project presentations can help graduates show what they can actually do.

For universities, verifiable productivity implies a need for authentic assessment. Wiggins (1998) argues that authentic assessment requires students to perform meaningful tasks that reflect real-world challenges. In business and management education, this may include consulting projects, HR analytics exercises, market research reports, process improvement proposals and client-based presentations. Such outputs create employability evidence.

For employers, verifiable productivity implies the need to assess graduate capability through work samples and practical tasks rather than relying only on degree credentials. This is particularly important when hiring graduates whose salary expectations must be justified by expected contribution.

7.2 Adaptive Skill Stacking

Adaptive skill stacking refers to the ability to combine complementary skills into differentiated capability. Individual skills may be commodified, outsourced or automated. However, combinations of skills can create value that is harder to replicate. A graduate who combines business knowledge, AI literacy, bilingual communication, data interpretation and contextual judgement may be more valuable than one who possesses each skill separately but cannot integrate them.

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This dimension aligns with graduate capital theory because employability depends on multiple resources rather than a single skill (Tomlinson, 2017; Clarke, 2018). It also reflects the changing nature of work. The OECD (2019) and World Economic Forum (2025) emphasise that workers increasingly need combinations of analytical, digital, social and adaptive capabilities.

For Hong Kong graduates, adaptive skill stacking may involve integrating management knowledge, English-Chinese communication, AI-enabled research, data literacy, local-regional market awareness and professional presentation. This combination can reduce substitutability because it is more difficult for employers to replace an integrated capability bundle with a single lower-cost worker or AI tool.

Universities can support adaptive skill stacking through interdisciplinary curricula, cross-module assessment and project-based learning. Employers can support it by giving graduates cross-functional exposure rather than limiting them to narrow administrative tasks.

7.3 Local-Regional Market Intelligence

Local-regional market intelligence refers to understanding the institutional, cultural, economic and business contexts in which work takes place. It includes knowledge of customer expectations, regulatory environments, professional norms, language practices, regional markets and industry-specific dynamics.

This dimension is critical for high-cost graduates because contextual knowledge can reduce substitutability. Remote workers or AI systems may perform standardised tasks efficiently, but they may lack deep understanding of local institutions, client expectations, cultural nuance or regional business relationships. In Hong Kong, local-regional intelligence may include understanding the city's role as a global business hub, its common law environment, its bilingual professional culture and its relationship with the Greater Bay Area.

This dimension connects to cultural and social capital (Tomlinson, 2017; Clarke, 2018), but it is more explicitly tied to employer value. Local-regional intelligence becomes employability capital when graduates can apply it to solve business problems, communicate with stakeholders or support cross-border opportunities.

7.4 Unoutsourceable Capabilities

Unoutsourceable capabilities refer to capabilities that are difficult to relocate, automate or standardise. These include stakeholder trust, ethical judgement, tacit organisational knowledge, client-facing communication, negotiation, crisis response and context-sensitive problem-solving.

The term "unoutsourceable" does not mean that such capabilities can never be performed elsewhere. Rather, it indicates that these capabilities are less vulnerable to pure cost competition because they depend on context, relationships and judgement. Autor's (2015) analysis of automation suggests that non-routine cognitive and interpersonal tasks are less easily automated

DOI: https://doi.org/10.56879/ijbm.v5i2.128

than routine tasks. Strategic HRM similarly suggests that valuable and unique human capital is less replaceable (Barney, 1991; Lepak and Snell, 1999).

For graduates, unoutsourceable capabilities require development through authentic experience. Internships, work-integrated learning, simulations, group projects, client-based assignments and reflective practice can help students develop judgement and relational competence.

7.5 Distinguishing Verifiable Productivity from Employer-Relevant Signalling

Although verifiable productivity and employer-relevant signalling are related, they represent different dimensions of the VALUE Framework. Verifiable productivity concerns the underlying value created by the graduate. It refers to whether the graduate can contribute to efficiency, quality, decision-making, customer experience, revenue generation, process improvement or organisational learning. Employer-relevant signalling concerns the visibility and credibility of that value. It refers to how the graduate communicates evidence of capability to employers through portfolios, project outputs, internship evaluations, certifications, work samples or outcome-based narratives.

This distinction is important because value creation and value visibility do not always coincide. A graduate may have created meaningful value during an internship or applied project but fail to communicate it convincingly to employers. Conversely, a graduate may present polished application materials without strong underlying evidence of productivity. The VALUE Framework therefore treats productivity and signalling as complementary but distinct. Verifiable productivity answers the question: What value has the graduate created? Employer-relevant signalling answers the question: How can employers observe, interpret and trust that value?

In high-cost labour markets, both dimensions are necessary. Productivity strengthens cost-adjusted graduate value, while signalling reduces employer uncertainty and makes that value visible during recruitment and selection. Together, they help reduce perceived labour substitutability.

7.6 Employer-Relevant Signalling

Within the VALUE Framework, employer-relevant signalling represents the practical expression of the broader theoretical construct of value-based employability signalling. Employer-relevant signalling refers to the ability to communicate capability in ways that employers find credible and useful. It includes portfolios, applied project outputs, internship evaluations, certifications, bilingual presentations, AI-use documentation and evidence of measurable contribution.

This dimension is essential because capability alone does not guarantee employability. Employers must be able to observe, interpret and trust the graduate's capability. In high-cost labour markets, employer-relevant signalling helps justify local hiring by reducing uncertainty and demonstrating value.

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Universities should therefore teach students not only to develop capabilities, but also to document and communicate them. Career education should move beyond CV formatting to value articulation. Graduates should learn to answer: What productivity can I prove? What makes me less substitutable? What evidence can I show?

Table 1 summarises the five VALUE dimensions and their implications for graduates, universities and employers.

Table 1. The VALUE Framework for High-Cost Graduate Competitiveness

VALUE Dimension	Core Meaning	Substitutability-Reduction Logic	Graduate Evidence
Verifiable productivity	Observable or measurable contribution	Reduces uncertainty about graduate value	Portfolios, project outputs, measurable improvements
Adaptive skill stacking	Integration of complementary capabilities	Makes capability harder to replicate through single-source labour or AI	Skill combinations such as AI + data + communication + business judgement
Local-regional market intelligence	Contextual understanding of local and regional markets	Creates context-specific value difficult to offshore	Hong Kong / GBA analysis, bilingual communication, sector insight
Unoutsourceable capabilities	Trust, judgement, relational and tacit capabilities	Reduces replaceability by emphasising non-routine human contribution	Stakeholder projects, client presentations, reflective practice
Employer-relevant signalling	Credible evidence of capability	Converts capability into employer-recognised value	CV evidence, portfolios, certifications, internship feedback

DOI: https://doi.org/10.56879/ijbm.v5i2.128

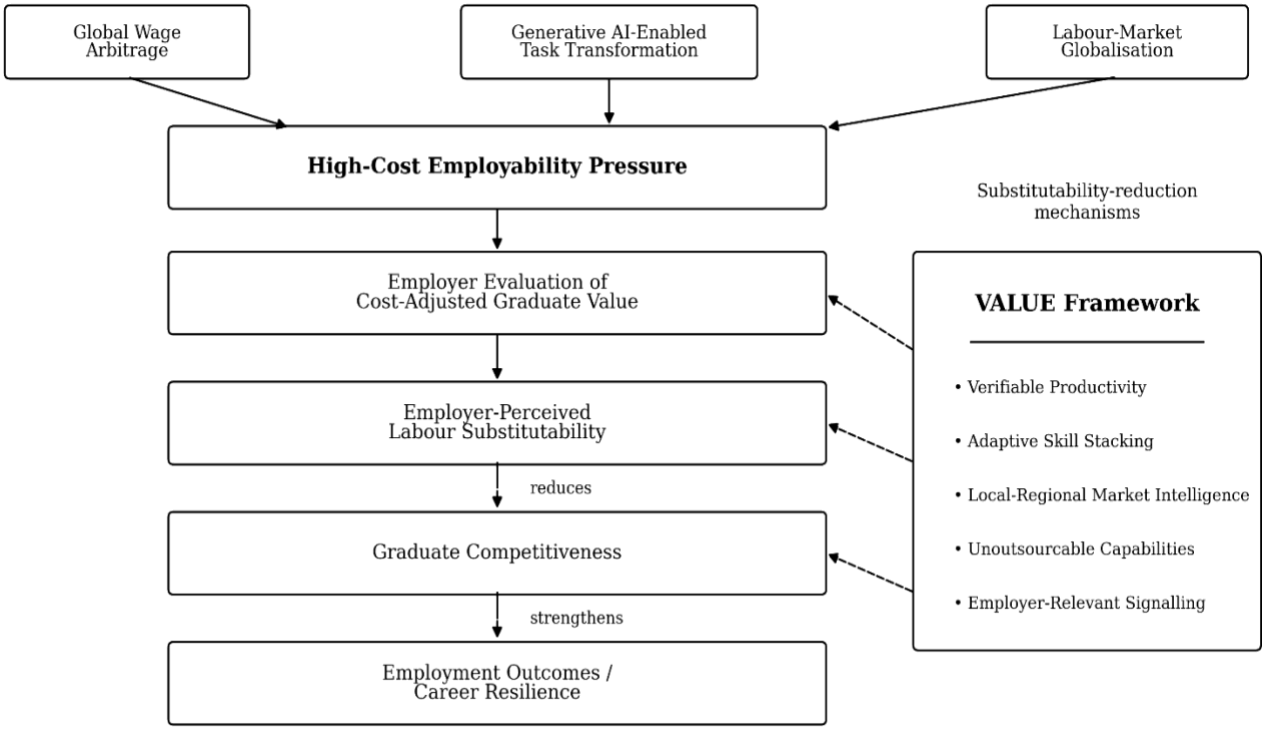
8. Conceptual Model and Propositions

The conceptual model proposed in this paper begins with three external labour-market pressures: global wage arbitrage, AI-enabled task transformation and labour-market globalisation. These pressures increase employer awareness of alternative ways to source graduate-level work. Employers become more likely to evaluate graduates through a cost-value lens. Under these conditions, high-cost graduates face intensified employability pressure. This pressure is not simply caused by a lack of skills. Rather, it is caused by uncertainty about whether local graduate labour provides sufficient value relative to lower-cost or technology-enabled alternatives. The key mediating construct is therefore employer-perceived labour substitutability.

The VALUE Framework is proposed as a set of mechanisms that reduce perceived substitutability. Graduates who demonstrate verifiable productivity, adaptive skill stacking, local-regional market intelligence, unoutsourceable capabilities and employer-relevant signalling are more likely to be perceived as cost-justified and less substitutable. Reduced perceived substitutability then strengthens graduate competitiveness, which may be reflected in stronger employer interest, better job matching, faster early-career progression and greater career resilience.

Figure 1 presents the conceptual model of high-cost graduate competitiveness through employer-perceived labour substitutability.

Figure 1. Conceptual Model



DOI: https://doi.org/10.56879/ijbm.v5i2.128

Note. The VALUE Framework is conceptualised as a set of substitutability-reduction mechanisms that strengthen cost-adjusted graduate value and reduce employer-perceived labour substitutability.

The model positions global wage arbitrage, generative AI-enabled task transformation and labour-market globalisation as external pressures that intensify employer evaluation of graduate labour through a cost-value lens. Employer-perceived labour substitutability functions as the central theoretical mechanism linking these external pressures with graduate competitiveness. The VALUE Framework is conceptualised as a set of substitutability-reduction mechanisms that enhance cost-adjusted graduate value and strengthen employment outcomes.

Proposition 1

In high-cost labour markets, graduate employability is influenced not only by skills possession but also by employer perceptions of cost-adjusted graduate value.

This proposition extends human capital theory by suggesting that the labour-market value of graduate skills is conditioned by employment cost. A graduate's knowledge and skills may enhance productivity, but employability depends on whether employers perceive the expected contribution as sufficient relative to salary, training and supervision costs. This is particularly relevant in cities such as Hong Kong, where local graduate labour may be compared with lower-cost regional alternatives.

Proposition 2

Employer-perceived labour substitutability mediates the relationship between external labour-market pressures and graduate competitiveness.

Global wage arbitrage, AI-enabled task transformation and remote work do not directly determine graduate competitiveness. Instead, they shape employer perceptions of whether graduate-level work can be sourced, automated or augmented through alternative means. When employers perceive that a graduate's expected tasks can be performed by lower-cost workers, outsourced providers or AI-enabled systems without meaningful loss of quality, trust or contextual effectiveness, the graduate's competitiveness decreases. Conversely, when graduates demonstrate capabilities that are difficult to source externally or automate, perceived substitutability declines and competitiveness improves.

Proposition 3

Verifiable productivity reduces employer uncertainty and strengthens cost-adjusted graduate value.

Because employers cannot fully observe graduate productivity before hiring, evidence of applied contribution becomes important. Work samples, portfolios, internship outputs and measurable project outcomes reduce uncertainty and allow employers to assess whether graduates can

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contribute value. Verifiable productivity therefore strengthens the graduate's cost-value justification.

Proposition 4

Adaptive skill stacking reduces perceived substitutability by combining capabilities that are difficult to replicate through single-source labour or AI systems.

Individual skills may be commodified, outsourced or automated. However, combinations of complementary skills — such as business knowledge, AI literacy, bilingual communication, data interpretation and contextual judgement — create more differentiated capability. Adaptive skill stacking therefore reduces the likelihood that a graduate will be perceived as replaceable by lower-cost or technology-enabled alternatives.

Proposition 5

Local-regional market intelligence enhances graduate competitiveness by creating context-specific value that is difficult to offshore.

Graduates who understand local institutions, regional markets, cultural norms, customer expectations and cross-border business environments provide value that cannot be easily replicated by remote workers. In Hong Kong, this includes knowledge of Hong Kong's common law environment, bilingual professional communication, Greater Bay Area connectivity and the city's intermediary role between Mainland China and global markets.

Proposition 6

Unoutsourceable capabilities reduce perceived labour substitutability by emphasising trust, judgement, stakeholder interaction and context-sensitive problem-solving.

Capabilities that depend on relational trust, ethical judgement, tacit knowledge and complex stakeholder interaction are less vulnerable to pure wage arbitrage or automation. Graduates who develop these capabilities are more likely to be perceived as strategically useful rather than operationally replaceable.

Proposition 7

Employer-relevant signalling strengthens the relationship between graduate capability and employer-perceived value.

Graduate capability alone is insufficient if employers cannot observe or interpret it. Employer-relevant signalling converts capability into credible evidence. Portfolios, applied project outputs, AI-use documentation, internship evaluations and outcome-based narratives help employers assess graduate value and reduce hiring uncertainty.

DOI: https://doi.org/10.56879/ijbm.v5i2.128

9. Implications for Universities and Programme Leaders

The VALUE Framework has several implications for higher education institutions, particularly those operating in high-cost labour markets.

First, universities should reposition employability from a peripheral support activity to a core curriculum design principle. Employability should not be limited to career talks, CV workshops or final-year job preparation. Instead, it should be embedded within programme learning outcomes, assessment design, industry engagement and student reflection (Yorke and Knight, 2006). The central curriculum question should be: how does this programme help students create and demonstrate value that employers recognise?

Second, programme leaders should design curricula around value creation rather than content coverage alone. In many business and management programmes, students learn theories and models but may struggle to explain how these create workplace value. Courses should therefore require students to diagnose organisational problems, analyse evidence, propose solutions and explain expected outcomes. This approach aligns with work-applied management because it connects academic learning with workplace relevance.

Third, AI literacy should be embedded across programmes. AI should not be treated only as a technical subject. Business, management, marketing, HRM, hospitality, education and creative industry students all need to understand how AI affects productivity, ethics, decision-making and professional communication. Students should learn how to use AI tools responsibly, verify outputs, avoid over-reliance, protect confidentiality and combine AI assistance with human judgement.

Fourth, assessment should generate employability evidence. Traditional examinations may assess knowledge, but they often produce little evidence that students can show to employers. Authentic assessments such as business reports, consulting projects, data analysis tasks, digital campaigns, presentations and reflective portfolios can generate stronger signals. These outputs should be curated into employability portfolios.

Fifth, universities should strengthen labour-market intelligence. Programme teams should regularly analyse job advertisements, employer feedback, internship reports, alumni outcomes and industry trends. In Hong Kong, this intelligence should include local labour-market shifts, Greater Bay Area developments, regional talent flows and digital transformation in service industries.

Sixth, universities should help students articulate their Hong Kong value proposition. Many Hong Kong students possess bilingual ability, cross-cultural exposure and local-regional familiarity, but they may not know how to translate these into employer-relevant language. Career education should teach students to communicate their value through evidence-based narratives.

10. Implications for Employers and HR Managers

The framework also has implications for employers and HR managers.

DOI: https://doi.org/10.56879/ijbm.v5i2.128

First, graduate recruitment should move beyond degree credentials and generic interviews. As signalling theory suggests, employers face uncertainty when assessing graduate productivity (Spence, 1973). Work samples, case exercises, portfolio reviews and structured interviews can provide stronger evidence than traditional screening methods. Employers should assess not only what graduates know, but how they apply knowledge to practical problems.

Second, employers should evaluate graduate value in relation to task design. If graduates are given only routine administrative tasks, they may appear easily replaceable by offshore labour or AI tools. However, if they are given opportunities to contribute to process improvement, customer analysis, digital transformation, stakeholder coordination or market research, their value may become more visible. Graduate productivity is therefore partly shaped by organisational role design.

Third, HR managers should treat graduate development as strategic human capital investment. Lepak and Snell's (1999) human resource architecture suggests that organisations should invest in human capital that is valuable and unique. If employers want high-cost graduates to justify their cost, they must develop their capabilities beyond routine task execution. Structured graduate programmes, mentoring, job rotation and project-based assignments can help graduates become more valuable and less substitutable.

Fourth, employers should develop responsible AI guidelines for junior roles. Rather than banning or ignoring AI use, organisations should clarify how graduates can use AI ethically and productively. Graduates should be trained to use AI tools while applying judgement, quality control and confidentiality awareness.

Fifth, employers in Hong Kong should leverage local-regional graduate capabilities. Hong Kong graduates may be particularly useful in roles requiring bilingual communication, regional coordination, client service, compliance awareness and cross-cultural understanding. These capabilities should be intentionally developed and utilised rather than underused in routine support roles.

11. Policy Implications for Hong Kong

The high-cost graduate challenge is not only an institutional or employer issue. It is also a policy issue. Hong Kong's long-term competitiveness depends on its ability to develop talent that can create high-value work in an internationally competitive environment. If graduates cannot demonstrate distinctive value, the city risks weakening its human capital advantage.

Policy actors can support graduate competitiveness in several ways. First, they can promote stronger university-industry collaboration. Work-integrated learning, applied projects, industry mentorship and sector-specific career pathways can help students develop realistic labour-market understanding. Second, they can support AI and digital upskilling for students and early-career workers. Third, they can encourage lifelong learning so that graduates continue developing after

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entering the workforce. Fourth, they can provide labour-market data and skills intelligence to help institutions update programmes.

Hong Kong's relationship with the Greater Bay Area is especially important. The GBA creates opportunities for innovation, entrepreneurship, technology, professional services and cultural exchange. However, it also intensifies talent comparison. Hong Kong graduates therefore need not only English proficiency and international awareness, but also Mainland market literacy, Putonghua communication, cross-border collaboration skills and understanding of regulatory and cultural differences.

At the same time, Hong Kong should not frame graduate competitiveness as a race to lower wages. A high-cost city cannot win by becoming cheap. It must win by becoming valuable. This requires education, employment and policy systems that support high-value capabilities. The VALUE Framework can help structure this effort by identifying capabilities that make graduates more resilient to wage arbitrage and technological substitution.

12. Theoretical Contributions

This paper makes three theoretical contributions.

First, it extends graduate employability literature by introducing cost-adjusted graduate value as a central construct for understanding employability in high-cost labour markets. Existing employability models have made important contributions by emphasising graduate skills, attributes, capitals and career readiness (Knight and Yorke, 2004; Yorke, 2006; Tomlinson, 2017; Clarke, 2018). However, these models do not fully explain how employers evaluate graduates when labour can be sourced across different cost environments. By incorporating cost-adjusted value, this paper reframes employability as an employer evaluation process in which graduate capability is assessed relative to employment cost, productivity expectations and available alternatives.

Second, the paper introduces employer-perceived labour substitutability as the key theoretical mechanism linking global wage arbitrage, AI-enabled work transformation and graduate competitiveness. This construct explains why high-cost graduates may face employability pressure even when they possess relevant skills. The issue is not simply whether graduates are capable, but whether employers believe their work can be performed by lower-cost workers or technology-enabled systems without significant loss of value. This contributes to employability theory by shifting attention from skills possession to substitutability reduction.

Third, the paper develops the VALUE Framework as a substitutability-reduction model rather than a generic employability checklist. The framework explains how graduates can increase cost-adjusted value and reduce perceived substitutability through verifiable productivity, adaptive skill stacking, local-regional market intelligence, unoutsourceable capabilities and employer-relevant

DOI: https://doi.org/10.56879/ijbm.v5i2.128

signalling. In doing so, the paper connects graduate employability theory with strategic human capital theory, signalling theory and work-applied management.

13. Practical Contributions

The paper provides practical contributions for universities, programme leaders, employers, HR managers, graduates and policymakers.

For universities, the VALUE Framework can guide curriculum design by shifting employability education from generic skills development to evidence-based value creation. Programme teams can use the framework to design authentic assessments, applied projects, AI-integrated learning activities, regional business analysis and portfolio-based employability evidence.

For employers and HR managers, the framework provides a more precise way to assess graduate potential. Instead of relying only on degree credentials, employers can evaluate whether graduates demonstrate productivity, integrated capabilities, contextual intelligence, stakeholder judgement and credible evidence of contribution. This is particularly important in high-cost cities where organisations must justify local hiring decisions.

For graduates, the framework offers a self-positioning tool. It encourages graduates to ask not only "What skills do I have?" but also "What value can I prove?", "What makes me less substitutable?" and "What evidence can I show employers?" This shift is essential in labour markets where AI, remote work and wage arbitrage increase competition for entry-level professional work.

For policymakers, the framework highlights the importance of strengthening high-value graduate capabilities rather than treating employability as a simple skills-gap issue. In Hong Kong, this means supporting AI literacy, work-integrated learning, Greater Bay Area business intelligence, bilingual professional communication and lifelong learning pathways.

14. Limitations and Future Research

As a conceptual paper, this study has limitations. It does not provide primary empirical data, and the proposed VALUE Framework has not yet been empirically tested. Hong Kong is used as a theoretically significant illustrative case rather than as the basis for generalisable empirical claims. Future research should therefore examine the framework using qualitative, quantitative and comparative methods.

One direction is employer interview research. Researchers could interview HR managers, SME owners, graduate recruiters and industry leaders in Hong Kong to examine how they perceive local graduate value compared with offshore talent and AI-enabled alternatives. Such research could explore whether employers explicitly consider cost-adjusted value and substitutability when hiring graduates.

DOI: https://doi.org/10.56879/ijbm.v5i2.128

A second direction is graduate survey research. Researchers could measure whether the five VALUE dimensions predict perceived employability, employment outcomes, salary progression or career confidence. This would allow the framework to be tested empirically.

A third direction is comparative city research. Future studies could compare Hong Kong with Singapore, London, Sydney or Seoul to examine whether similar high-cost graduate pressures exist across different institutional contexts. Such studies could clarify which aspects of the framework are generalisable and which are context-specific.

A fourth direction is sector-specific research. The impact of wage arbitrage and AI may vary across sectors such as finance, marketing, hospitality, education, creative industries and professional services. Sectoral analysis would help refine the framework.

Finally, future research should examine how AI reshapes entry-level graduate work. It is important to understand whether AI reduces demand for junior labour, raises productivity expectations or creates new forms of graduate value. This is especially important for universities designing curricula for future work.

15. Conclusion

This paper examined how graduates from high-cost labour markets can remain competitive in an era of global wage arbitrage, AI-enabled task transformation and cross-border talent substitution. Using Hong Kong as a theoretically significant case, it argued that graduate employability should be reframed as a problem of cost-adjusted value creation and perceived labour substitutability.

The paper reviewed literature on graduate employability, graduate capitals, human capital theory, signalling theory, strategic HRM, global wage arbitrage and AI-enabled work transformation. It argued that high-cost graduates cannot compete sustainably through qualifications or generic skills alone. Instead, they must demonstrate differentiated value that justifies their cost and reduces employer perceptions of replaceability.

The paper introduced three theoretical constructs: cost-adjusted graduate value, employer-perceived labour substitutability and value-based employability signalling. It then developed the VALUE Framework as a substitutability-reduction model consisting of Verifiable productivity, Adaptive skill stacking, Local-regional market intelligence, Unoutsourceable capabilities and Employer-relevant signalling.

The central message is that high-cost graduates should not attempt to compete by becoming cheaper. They must compete by becoming more valuable, more contextually intelligent, more technologically augmented and more difficult to replace. For Hong Kong, this is not only a graduate employability issue but also a question of long-term economic and human capital strategy.

DOI: https://doi.org/10.56879/ijbm.v5i2.128

Declarations

Funding

The author received no external funding for this research.

Conflict of Interest

The author declares no conflict of interest.

Ethical Approval

This conceptual paper does not involve human participants, personal data, interviews, experiments or identifiable organisational data. Institutional ethical approval was therefore not required.

Informed Consent

Not applicable.

Data Availability

No primary data were collected. The article is based on conceptual analysis and literature synthesis.

Use of Artificial Intelligence

Artificial intelligence tools were used to support language refinement, structural organisation and editorial preparation. The author reviewed, verified and approved the manuscript and remains fully responsible for its accuracy, originality and integrity.

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