



Quality information resources and graduate employability: A sequential mediation framework of career clarity and job market knowledge

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Abstract

Grounded in human capital theory (HCT), this study investigates how the quality of information resources (QIR) provided by institutional employability centres shapes students' perceived employability. Using three-wave, time-lagged data collected from students enrolled in various academic disciplines, covariance-based structural equation modelling (CB-SEM) was employed to test the hypothesised relationships. Results demonstrate that QIR positively predicts perceived employability (Hypothesis 1) and that this relationship is mediated by career clarity (Hypothesis 2), job market knowledge (Hypothesis 3), and the sequential pathway from career clarity to job market knowledge (Hypothesis 4). These findings offer theoretical and practical insights for academics, policymakers, and career development practitioners seeking to enhance employability outcomes through high-quality institutional resources.

Keywords: Career clarity, job market knowledge, employability, information resources, career development

Introduction

Enhancing graduate employability has become a central priority within higher education due to its implications for students' career prospects and broader socioeconomic development (Jackson *et al.*, 2024). Employability is also an increasingly important metric for assessing institutional performance and national workforce competitiveness (Bennett, 2019) ^[2]. Perceived employability, students' confidence in their ability to obtain desirable employment, is shaped by a range of educational and informational factors, including program quality, labour market cues, and career certainty (Thijssen *et al.*, 2008) ^[26]. Historically, employability initiatives emphasised curricular skill development, consistent with the human capital tradition (Holmes, 2013) ^[14]. However, emerging scholarship conceptualises employability as a multidimensional construct involving identity formation, self-directed career behaviour, and social engagement (Bridgstock, 2009; Jackson, 2016) ^[3, 15, 17]. These evolving perspectives underscore the need for further research to clarify how institutional resources shape perceptions of employability (Knezović, 2023).

In higher education, employability and career development centres play an instrumental role by providing students with guidance, structured career plans, and access to high-quality labour-market information (Engelland *et al.*, 2000) ^[6]. The present study conceptualises the quality of information resources (QIR) through the lens of academic advising quality (Springer & Tyran, 2022), which encompasses structured guidance to align students' academic pathways with their intellectual interests and career aspirations. Prior research suggests that credible labour market data and comprehensive job-search support strengthen students' decision-making capacity (Manlagaylay & Añar, 2022) ^[21], whereas limited access to such services hinders the development of employability competencies (Shuma & Basela, 2021).

Career clarity, defined as the degree to which individuals articulate clear, self-determined career goals (Hirschi *et al.*,

2018) ^[13], plays a crucial role in navigating an increasingly complex and unpredictable labour market (Xin *et al.*, 2020) ^[29]. Career clarity fluctuates across developmental stages (Chan, 2017) ^[5]. It is shaped by access to high-quality environmental resources, including informational and social resources that help students make sense of future career options (Hirschi *et al.*, 2018) ^[13]. Although extant literature suggests that clarity enhances students' preparedness, little is known about how career clarity functions as a mediator between institutional resources and employability outcomes. In parallel, job market knowledge (JMK), defined as one's general understanding of employment trends and labour market dynamics (Hirschi *et al.*, 2018) ^[13], is vital for effective career decision-making. Labour economists argue that employability is ultimately shaped by labour market structures rather than individual capacities alone (Brown *et al.*, 2003). New graduates face volatile and poorly signposted job markets, where expectations differ across socio-economic and cultural contexts (Layne, 2024). Students with stronger job market insights are better equipped to allocate resources, navigate opportunities, and identify desirable career pathways (Koen *et al.*, 2012; Tomlinson, 2007) ^[27].

Beyond individual mediation pathways, career clarity and JMK may operate sequentially. Conceptually, students first develop clarity about their career goals, which then motivates them to acquire specific job-market knowledge. This aligns with developmental models of career readiness, which hold that internal goal clarity precedes external knowledge acquisition (Hirschi *et al.*, 2017).

By testing these mediating mechanisms, the present study advances employability theory in several ways. First, it extends human capital theory by showing how institutional informational assets translate into employability outcomes through cognitive and informational pathways. Second, it provides empirical evidence on the interlinked roles of career clarity and JMK in shaping employability perceptions. Third, it offers actionable insights for institutions seeking to enhance the effectiveness of career support structures.

In practice, identifying the roles of QIR, career clarity, and JMK can guide universities in designing targeted interventions that enhance students' readiness for an increasingly competitive labour market. For practitioners, including academic advisers and career counsellors, these findings highlight the importance of integrating high-quality information provision with support for career goal formation and labour-market literacy. Such comprehensive approaches can strengthen employability initiatives and better align educational experiences with evolving workplace realities.

Theory and Hypotheses

Human Capital Theory

Human Capital Theory (HCT) provides a robust foundation for explaining how the quality of information resources (QIR) shapes students' career-related cognitions and, ultimately, their perceived employability. At its core, HCT posits that individuals intentionally invest in knowledge, skills, and competencies to enhance their economic value and future labour market outcomes (Becker, 1964). Such investments extend beyond formal academic learning to include access to high-quality informational resources that support decision-making about education and career pathways. Within higher education settings, institutional career services and informational tools constitute essential forms of human capital investment because they support students' development of career-relevant knowledge and capabilities (Springer & Tyran, 2022).

In this theoretical context, QIR is expected to play a central role in shaping career clarity, a construct referring to an individual's ability to articulate career goals, understand occupational requirements, and evaluate personal strengths relative to labour market expectations (Hirschi *et al.*, 2018) [13]. When students are provided with accurate, relevant, and timely career information, they are better positioned to reduce uncertainty, align their aspirations with realistic pathways, and develop the confidence necessary for effective career planning. HCT further emphasises the importance of knowledge of labour market conditions, as individuals who possess job market knowledge (JMK) are better able to respond to economic shifts, identify opportunities, and position themselves competitively (Schultz, 1961; Coff & Raffiee, 2015) [25]. JMK therefore represents an additional dimension of human capital that allows students to form realistic expectations about employment opportunities and skill demands (Bennett, 2019) [2].

Building on these insights, our theoretical model (Figure 1) conceptualises QIR as a foundational educational input that influences perceived employability both directly and indirectly through cognitive career resources. Specifically, we contend that QIR enhances perceived employability by improving students' career clarity and enabling the development of JMK. Moreover, the model suggests a sequential process in which QIR first enhances career clarity, which subsequently enables students to acquire more accurate and relevant JMK. This sequential pathway reflects HCT's proposition that informed and well-structured investments in knowledge catalyse further developmental gains, ultimately strengthening employability beliefs. Overall, HCT offers a coherent lens through which to understand how QIR initiates a chain of informational and cognitive mechanisms that culminate in heightened perceived employability.

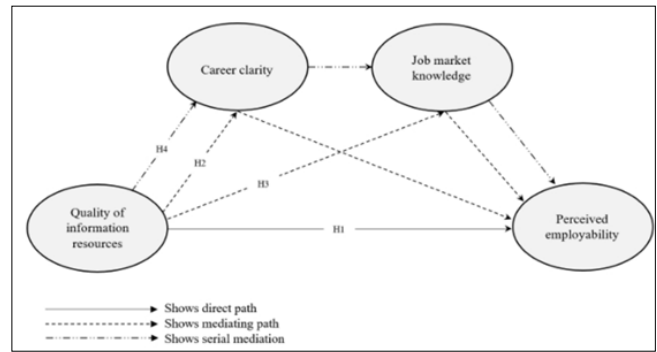


Fig 1: Proposed Theoretical Framework

QIR and Students' Perceived Employability

The centrality of employability in higher education has grown significantly, as universities increasingly aim to prepare students for competitive, rapidly changing labour markets (Jackson *et al.*, 2024; Yorke, 2006). Students now expect institutions not only to equip them with disciplinary competencies but also to provide structured employability-enhancing opportunities such as mentoring, career counselling, and work-integrated learning. High-quality information resources are particularly critical, as they help students identify viable career options, understand evolving skill requirements, and evaluate potential career pathways. Empirical evidence consistently shows that effective career counselling increases individuals' awareness of market-relevant competencies, reduces skills mismatches, and enhances economic efficiency (Haxhihyseni *et al.*, 2021) [10]. Conversely, the absence of structured career guidance has been shown to impede students' capacity to develop employability competencies, thereby limiting their ability to navigate the transition from university to work (Shuma & Basela, 2021).

In line with HCT, such institutional resources serve as vehicles for human capital development, equipping students with the strategic knowledge required for workforce entry. As Becker (1964, 1993) argues, access to timely and relevant information significantly enhances individuals' employability by enabling them to recognise labour market opportunities and make informed decisions about skill acquisition. Similarly, research shows that recurrent and reliable career information supports students' readiness for employment by shaping their career-related judgments throughout the academic journey (Jackson *et al.*, 2024). When viewed through this theoretical lens, QIR emerges as a critical precursor to perceived employability, as it provides the informational infrastructure students need to engage meaningfully with labour market demands. Drawing on these theoretical and empirical considerations, we propose the following hypothesis

Hypothesis 1: QIR and students' perceived employability are positively related.

QIR, Career Clarity, and Students' Perceived Employability

While quality information resources (QIRs) may directly influence students' perceived employability, research indicates that this relationship likely operates indirectly through career clarity. Career clarity is defined as the degree to which individuals possess coherent, self-determined, and well-articulated career goals (Hirschi *et al.*, 2018) [13]. It

provides the cognitive framework for informed career decision-making and enables individuals to align their skills with labour-market requirements (Savickas, 2005). Access to high-quality information, including guidance on occupational requirements, skill development pathways, and future employment prospects, enables students to formulate realistic career plans and envision achievable professional trajectories (Monaghan *et al.*, 2023).

Institutional career services play a pivotal role in fostering career clarity. Activities such as workshops, seminars, and individualised counselling enhance students' confidence in career decision-making and help them evaluate the fit between their skills and different occupational contexts (Lent *et al.*, 1994) [20]. These initiatives contribute to the development of self-management capabilities, an increasingly critical competency in contemporary labour markets characterised by high mobility and less hierarchical organisational structures (Jackson & Wilton, 2016) [15, 17]. By facilitating career clarity, QIR support students in aligning their aspirations with labour market realities, thereby positively influencing perceived employability through heightened self-awareness and goal alignment (Guan *et al.*, 2013) [8].

HCT reinforces this connection by positing that investments in information and education improve decision-making and labour market outcomes (Becker, 1964; Schultz, 1961) [25]. From this perspective, QIR can be understood as a form of human capital investment that strengthens career clarity by helping students match their strengths, interests, and competencies with employer expectations. Enhanced career clarity subsequently increases students' confidence in their employability, as they are better able to identify viable career paths and strategically position themselves in the labour market. On this basis, we propose the following hypothesis

Hypothesis 2: Career clarity acts as a mediator between QIR and perceived employability.

QIR, Job Market Knowledge, and Students' Perceived Employability

In addition to fostering career clarity, QIR may influence perceived employability by developing job market knowledge (JMK). HCT posits that knowledge, particularly knowledge that reduces uncertainty about labour market dynamics, constitutes a critical component of human capital that enhances individuals' competitiveness (Becker, 1964; Thijssen *et al.*, 2008) [26]. JMK encompasses awareness of labour market trends, industry demands, employment opportunities, and occupational requirements (Rothwell & Arnold, 2007) [24]. By developing JMK, students are better equipped to evaluate their employability realistically, comparing their capabilities to market expectations.

High-quality informational resources provide timely and accurate labour market insights, enabling students to interpret job demands, anticipate employer needs, and adjust skill development strategies accordingly (Brown & Hesketh, 2004; Fugate *et al.*, 2004) [7, 12]. Students with strong JMK can navigate career opportunities more strategically, thereby enhancing their confidence in achieving employability outcomes (Tomlinson, 2007) [27]. Within the HCT framework, JMK serves as a key mechanism through which QIR translates into perceived employability, as access to labour-market knowledge equips students with the cognitive

tools required to respond to competitive labour-market conditions (Bridgstock, 2009) [3]. Accordingly, we propose

Hypothesis 3: JMK acts as a mediator between QIR and perceived employability.

Sequential Mediation of Career Clarity and JMK

HCT further suggests that individuals enhance their productivity and labour-market value by acquiring relevant knowledge, skills, and experience (Becker, 1964). While students pursue higher education to improve employability, engagement with institutional employability initiatives is often lower than expected, highlighting gaps in awareness, motivation, or perceived relevance (Jackson & Tomlinson, 2021). Recent research emphasises the need for structured, discipline-specific, and developmental approaches to employability enhancement, which strengthen students' understanding of career competencies and increase their engagement with institutional resources (Jackson *et al.*, 2024). Within this context, QIR represent a critical element of employability-building, providing timely, accurate, and actionable information to guide career development (Sultana, 2013).

QIR supports students in acquiring relevant information about career opportunities, occupational requirements, and emerging labour market demands, which contributes to career clarity and to students' understanding of their professional goals, values, and the steps required to achieve them (Montanez, 2018). Access to credible informational resources strengthens career clarity by facilitating career exploration and long-term planning (Taveira & Moreno, 2003). In dynamic labour markets, students with clear career goals are better able to adapt to evolving organisational expectations and align their competencies with employer needs (Homegardner, 2024). Career clarity, therefore, functions as a psychological mechanism linking QIR to perceived employability.

In parallel, QIR facilitate the development of JMK, defined as students' understanding of labour market conditions, professional requirements, and industry opportunities. Students with accurate JMK can strategically align their capabilities with market expectations, enhancing competitiveness and employability (Tomlinson, 2017) [28]. High-quality informational resources, including career centres, labour market reports, and professional networks, are essential for acquiring JMK (Brown & Hesketh, 2004) [12]. Consequently, students with enhanced JMK are more likely to make informed career decisions and to perceive themselves as employable (Fugate *et al.*, 2004) [7].

Integrating these mechanisms within HCT, QIR functions as an institutional investment that enhances both cognitive and informational human capital. A sequential process emerges wherein QIR first improves career clarity, which subsequently facilitates the acquisition of JMK, ultimately increasing perceived employability. This sequential mediation aligns with prior research indicating that clarity in career goals precedes labour-market knowledge acquisition, and that, together, these factors strengthen employability outcomes (Briscoe *et al.*, 2012; Kelan, 2008) [18]. Accordingly, we propose

Hypothesis 4: Career clarity and JMK sequentially mediate the relationship between QIR and perceived employability.

Method

Participants and Procedure

To empirically examine the proposed relationships between QIR and perceived employability, as well as the mediating roles of career clarity and job market knowledge (JMK) in Hypotheses 1 through 4, we collected three-wave, time-lagged survey data from final-year students enrolled in professional degree programs across diverse faculties, including allied health sciences, arts, business, information technology, economics, medical sciences, and pharmacy. A two-week interval was employed between each wave to minimise the risk of common method bias (Podsakoff *et al.*, 2003) [23], which is particularly important in mediation models such as those proposed in this study. Data collection was conducted through official, institution-managed online student groups, with distribution facilitated by a representative from the university's employability centre. This collaboration enhanced the study's legitimacy and supported a strong response rate. Participants received a detailed description of the study objectives, assurances of ethical conduct, and instructions for generating a unique identifier code, which enabled accurate matching of responses across the three waves. This identifier was mandatory and placed immediately after the preliminary instructions and before demographic items to encourage careful participation. To ensure data quality, we included an attention check item in each wave ("To confirm you are paying attention, please select 'strongly disagree' for this question"), following best practices for online surveys (Meade & Craig, 2012) [22]. Participants failing attention checks were excluded from subsequent survey waves. In total, 488 students responded in Wave 1 (T1), which included demographic items and measures of QIR. After excluding participants who failed the attention check (n = 21), 467 students were invited to participate in Wave 2 (T2), during which they completed measures of career clarity and JMK. Following additional exclusions for nonresponse (n = 13) and failed attention checks (n = 7), 447 students remained eligible for Wave 3 (T3). At T3, participants completed items assessing perceived employability. After excluding nonrespondents (n = 11) and attention-check failures (n = 3), we retained 433 cases. A further 18 cases were removed during data screening due to substantial missing responses, resulting in a final analytical sample of 415 students. The final sample consisted of 52.3% women (n = 217) and 47.5% men (n = 197), with the vast majority aged 18–27 years (99.5%). Most participants were enrolled in the

Faculty of Allied Health Sciences (54.9%), whereas the Faculty of Economics and Commerce had the fewest participants (0.2%). These demographics reflect the composition of final-year enrollments across the participating institution's faculties.

Measures

All constructs were measured using established multi-item scales, with responses captured on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Quality of Information Resources (QIR): QIR was measured using three items developed by Springer and Tyran (2022) that assessed the perceived accuracy, accessibility, and usefulness of career-related information provided by the campus employability centre. A sample item is, "The advising group has advising-related information readily available for students." The scale demonstrated excellent internal consistency ($\alpha = .93$).

Career Clarity: Career clarity was assessed using three items adapted from Hirschi *et al.* (2018) [13] that capture students' understanding of their career goals and pathways. A sample item is, "I have a clear understanding of what I want to achieve in my career." Internal reliability was excellent ($\alpha = .95$).

Job Market Knowledge (JMK): JMK was measured using three items from Hirschi *et al.* (2018) [13] that assess students' awareness of job market trends and occupational requirements. A sample item is, "I have a good knowledge of the job market." The scale showed high reliability ($\alpha = .94$).

Perceived Employability: Perceived employability was assessed with five items developed by Trullàs *et al.* (2018). Items captured students' confidence in securing employment upon graduation. A sample item is, "I am sure that when I finish my studies, I will find work." Internal consistency was strong ($\alpha = .89$).

Analytical Strategy

Preliminary Analyses

We conducted descriptive and correlational analyses using SPSS 23.0, including means, standard deviations, and intercorrelations (Table 1). We also assessed multicollinearity using variance inflation factors (VIFs), presented in Table 2.

Variables	Mean	SD	1	2	3	4
1. Information Resources	3.92	1.08	1			
2. Job Market Knowledge	3.67	1.11	.523**	1		
3. Career Clarity	4.10	1.05	.576**	.630**	1	
4. Perceived Employability	3.81	1.05	.619**	.614**	.701**	1

Note. N = 415
 ** Correlation is significant at the 0.01 level (2-tailed)

Confirmatory Factor Analyses (CFA)

To evaluate the distinctiveness and validity of the four constructs, QIR, career clarity, JMK, and perceived employability,

we conducted a covariance-based structural equation model (CB-SEM) using maximum likelihood estimation. We allowed up to 1,000 iterations to ensure convergence.

Model fit was evaluated using multiple indices recommended in the SEM literature

χ^2 (Hu & Bentler, 1999)

RMSEA (Steiger, 1990)

SRMR (Hu & Bentler, 1999)

CFI and TLI (Hu & Bentler, 1999)

Reliability and convergent validity for each construct were assessed using composite reliability (CR), Cronbach's α , and average variance extracted (AVE), summarised in Table 3.

To evaluate measurement model superiority, we compared the proposed four-factor model (Model 4) with three alternative models

Model 1: All items loading on a single factor.

Model 2: QIR, JMK, and career clarity combined into a single factor.

Model 3: QIR and JMK combined; career clarity separates.

Model 4 demonstrated the best fit, supporting the conceptualisation of QIR, career clarity, JMK, and perceived employability as distinct but related constructs. This model was subsequently used to test Hypotheses 1–4.

Table 2. Reliability, Validity, and Multicollinearity

	1	2	3	4	VIF	α	CR	AVE
<i>Heterotrait-monotrait ratio (HTMT)</i>								
1. Career clarity					1.925	0.952	0.952	0.869
2. Information resources	0.610				1.599	0.936	0.938	0.833
3. Job market knowledge	0.664	0.556			1.770	0.945	0.946	0.854
4. Perceived employability	0.759	0.677	0.668			0.892	0.895	0.680
<i>Fornell-Larcker criterion</i>								
1. Career clarity	0.932							
2. Information resources	0.601	0.913						
3. Job market knowledge	0.650	0.550	0.924					
4. Perceived employability	0.757	0.666	0.657	0.824				

Results

The descriptive statistics, standard deviations, and bivariate correlations for all variables are presented in Table 1. Table 3 reports the results of the confirmatory factor analyses (CFA). Consistent with expectations, the hypothesised four-factor model, comprising QIR, career clarity, JMK, and perceived employability, demonstrated a significantly superior fit to the data relative to the alternative models. The four-factor model yielded acceptable fit indices ($\chi^2 = 194.89$, $df = 59$, RMSEA = .07, SRMR = .03, TLI = .96, CFI = .97), outperforming the three-factor model that combined QIR and JMK ($\chi^2 = 2033.72$, $df = 77$, RMSEA = .24, SRMR = .10, TLI = .58, CFI = .64), the two-factor model that combined QIR, JMK, and career clarity ($\chi^2 = 1792.97$, $df = 76$, RMSEA = .23, SRMR = .10, TLI = .62, CFI = .68), and the one-factor model combining all

constructs ($\chi^2 = 2033.72$, $df = 77$, RMSEA = .24, SRMR = .10, TLI = .58, CFI = .64). These results confirm the conceptual distinctiveness of the constructs used to test Hypotheses 1–4.

All factor loadings exceeded the recommended minimum of .50 (Hair *et al.*, 2010), demonstrating strong item-level reliability. Specifically, loadings ranged from .88 to .94 for QIR, from .92 to .95 for career clarity, from .89 to .95 for JMK, and from .74 to .86 for perceived employability. Convergent validity was established for all constructs, as average variance extracted (AVE) values exceeded .50 (Hair *et al.*, 2014). Discriminant validity was supported because all Heterotrait–Monotrait (HTMT) ratios were below the .85 thresholds (Henseler *et al.*, 2015) [11]. These results provide strong empirical justification for the subsequent hypothesis testing (Table 2).

Table 3. Confirmatory Factor Analysis

Model	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf	RMSEA	SRMR	NFI	TLI	CFI
Model 4 (four factors model) ^a	194.899	59	3.303			0.075	0.037	0.964	0.967	0.975
Model 3 (three factors model) ^b	1151.387	74	15.559	12.256	15	0.187	0.118	0.795	0.760	0.805
Model 2 (two factors model) ^c	1792.971	76	23.592	20.288	17	0.233	0.102	0.681	0.628	0.689
Model 1 (one factor model) ^d	2033.728	77	26.412	23.109	18	0.247	0.104	0.638	0.582	0.646

^a This is the proposed four factors model
^b This model combines IR and JMK into one factor
^c this model combines IR, JMK, and CC into one factor
^d This model clubs all variables into factor

Hypotheses Testing

Hypothesis testing results are reported in Table 4. Aligning with Hypothesis 1, QIR exhibited a significant positive relationship with students' perceived employability ($\beta = .27$, $t = 4.33$, $p < .001$). This finding suggests that students who access high-quality informational resources at institutional

employability centres perceive themselves as more capable of securing employment upon graduation.

Supporting Hypothesis 2, career clarity significantly mediated the relationship between QIR and perceived employability ($\beta = .27$, $t = 5.44$, $p < .001$). This result indicates that QIR enhances students' clarity about their

career goals and pathways, thereby strengthening their perceived employability.

Consistent with Hypothesis 3, JMK also served as a significant mediator in the QIR–perceived employability relationship ($\beta = .05, t = 2.44, p = .014$). This suggests that students who receive accurate and relevant information about the job market develop greater awareness of occupational demands, which enhances their perceived employability.

Finally, supporting Hypothesis 4, sequential mediation

analysis revealed that QIR indirectly influenced perceived employability through a two-step pathway: QIR → career clarity → JMK → perceived employability ($\beta = .06, t = 2.76, p = .006$). This result indicates that career clarity serves as an initial cognitive mechanism that enables students to acquire job-market knowledge, which, in turn, enhances their perceived employability.

Together, these findings provide comprehensive evidence that QIR shapes employability outcomes both directly and through distinct and sequential mediating mechanisms.

Table 4. Results of Structural Model Assessment

		β	t value	p values	CI [2.5%, 97.5%]	Hypothesis
Direct effects						
	CC → JMK	0.500	7.424	0.000 *	[0.363, 0.626]	
	CC → PE	0.454	6.019	0.000 *	[0.299, 0.596]	-
	IR → CC	0.601	12.282	0.000 *	[0.499, 0.692]	-
	IR → JMK	0.249	3.630	0.000 *	[0.116, 0.382]	-
	IR → PE	0.278	4.337	0.000 *	[0.156, 0.406]	Supported [H1]
	JMK → PE	0.209	3.340	0.001 **	[0.091, 0.337]	-
Indirect Effects						
	CC → JMK → PE	0.104	2.875	0.004 **	[0.042, 0.183]	-
	IR → JMK → PE	0.052	2.446	0.014 **	[0.017, 0.100]	Supported [H3]
	IR → CC → JMK	0.301	6.076	0.000 *	[0.208, 0.402]	-
	IR → CC → PE	0.273	5.449	0.000 *	[0.173, 0.372]	Supported [H2]
	IR → CC → JMK → PE	0.063	2.769	0.006 **	[0.025, 0.114]	Supported [H4]
Total effects						
	CC → JMK	0.500	7.424	0.000 **	[0.363, 0.626]	-
	CC → PE	0.558	8.635	0.000 **	[0.424, 0.680]	-
	IR → CC	0.601	12.282	0.000 **	[0.499, 0.692]	-
	IR → JMK	0.550	11.545	0.000 **	[0.453, 0.637]	-
	IR → PE	0.666	13.896	0.000 **	[0.566, 0.756]	-
	JMK → PE	0.209	3.340	0.001 *	[0.091, 0.337]	-

* $p < 0.01$, ** $p < 0.001$

Discussion

Guided by Human Capital Theory (HCT; Becker, 1964), this study examined how the Quality of Information Resources (QIR) provided by institutional employability centres contributes to students' perceived employability. The findings provide consistent support for all four hypotheses and contribute to a more nuanced understanding of how informational resources influence employability-related outcomes.

First, the results confirm that QIR directly enhance perceived employability (H1). This aligns with HCT, which posits that access to relevant information constitutes a key human capital investment that improves individuals' labour market prospects (Schultz, 1961) [25]. Students who receive accurate and timely information about academic pathways, internships, and job opportunities appear more confident in their ability to secure employment.

Second, the findings show that career clarity mediates the association between QIR and perceived employability (H2). This indicates that QIR play a central role in helping students articulate career goals and understand the steps needed to achieve them. This cognitive clarity enhances their sense of preparedness for the labour market, consistent with prior research linking career goal clarity to perceptions of employability (Hirschi *et al.*, 2018) [13].

Third, JMK was found to mediate the relationship between QIR and perceived employability (H3). This suggests that informational resources function not only as guidance but also as tools for building concrete knowledge of labour market structures, occupational demands, and opportunities,

elements long recognised as essential components of employability (Tomlinson, 2017) [28].

Finally, the sequential mediation result (H4) makes an important theoretical contribution by showing that QIR first fosters career clarity, which subsequently enables students to acquire relevant job-market knowledge. This sequential pathway aligns with career development theory, which posits that individuals must first establish clear career goals before effectively seeking and interpreting job market information (Briscoe *et al.*, 2012). The results reinforce the interpretation of QIR as a foundational human capital investment that catalyses deeper career-related learning processes.

In sum, this study extends HCT by demonstrating that the effects of informational resources on employability are not only direct but also operate through cognitive (career clarity) and informational (JMK) mechanisms, both independently and sequentially. These findings have significant implications for higher education institutions seeking to strengthen employability services and support students' transition into the labour market.

Theoretical Implications

This study contributes to the employability literature by deepening conceptual and empirical understanding of how institutional information resources influence students' perceived employability through the lens of Human Capital Theory (HCT). By examining the mediating roles of career clarity and job market knowledge (JMK), the study clarifies the mechanisms through which quality of information

resources (QIR) affects employability perceptions and thus refines theoretical perspectives on employability formation. First, the study extends HCT by conceptualising QIR as a critical and underexplored form of human capital. While classical HCT emphasises investments in knowledge, skills, and training as drivers of improved labour market outcomes (Becker, 1964; Schultz, 1961) ^[25], the role of institutional information resources, particularly those provided through employability centres, has received little systematic attention. Our findings illustrate that QIR functions as a foundational informational asset, equipping students with the relevant guidance needed to navigate educational and occupational decisions. This supports the argument that institutions can enhance human capital not only through formal instruction but also by investing in high-quality career advisory infrastructures (Springer & Tyran, 2022). Thus, QIR emerge as a valuable institutional input that contributes directly to students' perceived employability (H1).

Second, the discovery of sequential mediation provides a novel theoretical perspective. The finding that QIR first enhance career clarity, which in turn facilitates the acquisition of JMK, offers a structured understanding of how employability-relevant cognitions develop (H2–H4). This sequential pathway enriches the existing literature by integrating internal psychological resources (career clarity) and external informational resources (JMK) within a unified framework. Prior research has often examined these constructs independently, but combining them advances theoretical clarity regarding how students transition from understanding themselves to understanding the labour market (Hirschi *et al.*, 2018; Koen *et al.*, 2012) ^[13]. The study, therefore, fills a critical gap by showing that clarity about one's career direction serves as a precursor to effectively assimilating job-market information, ultimately strengthening perceptions of employability.

Third, the findings highlight the interconnectedness of intermediary mechanisms that shape students' employability beliefs. Although earlier studies acknowledged the importance of institutional resources for employability outcomes (Bridgstock, 2009; Tomlinson, 2007) ^[3, 27], insufficient attention has been paid to identifying specific psychological and informational processes that link these resources to perceived employability. By empirically demonstrating the mediating roles of career clarity and JMK, this research not only elaborates on the multidimensional nature of employability development but also provides a theoretically grounded explanation of how institutional interventions cultivate employability-related confidence.

Lastly, the study reinforces the value of situating employability development within HCT. The results confirm that QIR operate as a form of human capital investment that helps students interpret labour market complexities, strengthen their competitiveness, and enhance their perceived readiness for employment (Becker, 1964). In this regard, the study broadens the applicability of HCT by showing how informational resources beyond traditional academic training support students' capacity to navigate career and labour-market challenges.

Practical Implications

The findings offer several actionable implications for academic administrators, career counsellors, instructors, and

policymakers seeking to enhance students' perceived employability in increasingly competitive labour markets.

First, institutions should recognise QIR as a strategic asset capable of shaping students' perceptions of employability. Given the demonstrated positive effects of QIR on perceived employability, investment in high-quality informational resources, such as well-trained advisors, updated career materials, and accessible labour market data, should be prioritised. Employability centres may leverage digital platforms to expand access to accurate, timely information on job opportunities, career pathways, and emerging industry trends, thereby enabling students to make informed career decisions (Springer & Tyran, 2022). Academic instructors also play a vital role by incorporating student-centred career guidance into their teaching, reinforcing the institutional ecosystem of informational support.

Second, institutions should develop structured employability programs designed to enhance both career clarity and JMK, reflecting the dual mediating mechanisms identified in this study. Workshops focused on career planning, labour market analysis, and skills assessment can help students articulate career goals and align them with market demands. Complementary initiatives, such as mock interviews, career fairs, mentoring programs, and employer engagement events, offer experiential learning opportunities that help students deepen their understanding of labour market expectations (Hirschi *et al.*, 2018; Tomlinson, 2007) ^[13, 27]. Integrating career development content within academic curricula can ensure continuous exposure to employability-building resources.

Third, recognising that career clarity and labour market knowledge evolve over time, institutions should extend employability support beyond graduation. Alum networks and continuing professional development programs can help graduates stay informed about emerging labour market trends, skill requirements, and advancement opportunities (Chan, 2017; Xin *et al.*, 2020) ^[5, 29]. Such long-term engagement would reinforce the view of employability as a dynamic, lifelong process.

Fourth, the practical relevance of the study's sequential mediation model lies in highlighting the need for interventions that address both internal and external dimensions of employability. Employability centres can utilise these insights to design assessments and services that monitor changes in career clarity, facilitate targeted career coaching, and provide labour-market intelligence aligned with students' evolving goals.

Finally, at the policy level, national employability frameworks should standardise access to high-quality career information and ensure equitable provision of guidance resources across institutions. Collaboration among policymakers, industry professionals, academic leaders, and career advisors can facilitate the development of career frameworks aligned with labour-market realities, thereby strengthening national employability ecosystems (Brown *et al.*, 2003).

Limitations and Future Research Directions

Despite its contributions, this study is subject to several limitations that highlight opportunities for future scholarly inquiry. First, the sample was drawn from final-year students within selected faculties of a single higher education institution. Although this sampling approach

allowed for focused data collection, it limits the external validity and generalizability of the findings. Future research should seek to replicate and validate the proposed model across multiple institutions, diverse academic disciplines, and varied cultural and geographical contexts. Such comparative analyses would help determine whether the relationships among QIR, career clarity, job market knowledge (JMK), and perceived employability hold consistently across different educational and socioeconomic environments.

Second, although the use of a time-lagged research design strengthens causal inferences by reducing common method bias, it does not fully capture the longitudinal evolution of employability development. Employability is a dynamic construct shaped by students' ongoing interactions with institutional resources, experiential learning, and shifting labour market conditions. Future research would benefit from implementing extended longitudinal designs that follow students from their early academic years through graduation and into post-university employment. Such designs would offer more profound insights into how QIR influence employability trajectories over time, particularly during the transition from university to the labour market.

Third, this study focused on the quality of information resources as conceptualised by Springer and Tyran (2022) to evaluate institutional career support. Although this construct captures the effectiveness of informational inputs, it does not account for other important qualitative dimensions of career services, such as the reliability of the information provided and the empathy of career advisors. Given that empathetic communication and trustworthy guidance may substantially enhance students' clarity and confidence in navigating career pathways, future research should explore these additional service attributes as potential moderators or mediators. Integrating these factors could enrich understanding of how employability centres shape student outcomes.

Finally, employability literature increasingly recognises a broader set of individual career resources that may interact with institutional inputs. Constructs such as career crafting (Zhou *et al.*, 2024) ^[30] and employability-related competencies (Vanhercke *et al.*, 2024) have demonstrated meaningful links to students' perceived employability. Incorporating these emerging variables into the current framework may further refine the theoretical model by capturing the interplay between institutional support and students' proactive career behaviours. Future studies could extend the present model by examining how these additional resources complement or interact with QIR, career clarity, and JMK to shape employability development.

Conclusion

Grounded in Human Capital Theory (HCT), this study advances understanding of how institutional information resources shape students' perceived employability. Through rigorous empirical testing using time-lagged data, the study demonstrates that QIR provided by institutional employability centres significantly contributes to students' perceived employability, both directly and indirectly. Importantly, the findings reveal that career clarity and JMK serve as independent mediators and operate sequentially to explain the pathway through which QIR enhance students' employability beliefs. These results underscore the multifaceted nature of employability development and

highlight the pivotal role of informational and psychological resources in preparing students for an increasingly complex labour market.

The study also offers valuable theoretical contributions by positioning QIR as a critical component of human capital and by integrating internal (career clarity) and external (JMK) employability resources within a single explanatory framework. Practically, the findings provide actionable insights for educators, career practitioners, and policymakers seeking to design and deliver evidence-based employability interventions that address both informational needs and developmental processes.

While acknowledging several limitations, this research lays a foundation for future empirical and theoretical advancement. Continued exploration across diverse contexts, longitudinal trajectories, and expanded career resource frameworks will deepen understanding of how institutions can effectively support students' career development. Overall, the study affirms that strategic investment in high-quality information resources is essential for equipping graduates with the clarity, knowledge, and confidence needed to navigate contemporary labour markets effectively.

References

1. Becker GS. Human capital: A theoretical and empirical analysis, with special reference to education. University of Chicago press, 2009. <https://doi.org/10.7208/chicago/9780226041223.001.0001>
2. Bennett D. Graduate employability and higher education: Past, present and future. *HERDSA Review of Higher Education*,2019;5:31-61. https://doi.org/10.1163/9789004418707_009
3. Bridgstock R. The graduate attributes we've overlooked: Enhancing graduate employability through career management skills. *Higher education research development*,2009;28(1):31-44. <https://doi.org/10.1080/07294360802444347>
4. Brown SD, Lent RW. (Eds.). *Career development and counseling: Putting theory and research to work*. John Wiley Sons, 2012. <https://doi.org/10.1002/97811394258994>
5. Chan M. The importance of career clarity and proactive career behaviours in predicting positive student outcomes: Evidence across two cohorts of secondary students in Singapore. *Asia Pacific Journal of Education*,2017;37(4):601-614. <https://doi.org/10.1080/02188791.2017.1388214>
6. Engelland BT, Workman L, Singh M. Ensuring service quality for campus career services centers: a modified SERVQUAL scale. *Journal of marketing Education*,2000;22(3):236-245. <https://doi.org/10.1177/0273475300223007>
7. Fugate M, Kinicki AJ, Ashforth BE. Employability: A psycho-social construct, its dimensions, and applications. *Journal of Vocational behavior*,2004;65(1):14-38. <https://doi.org/10.1016/j.jvb.2003.10.005>
8. Guan Y, Deng H, Sun J, Wang Y, Cai Z, Ye L, *et al.* Career adaptability, job search self-efficacy and outcomes: A three-wave investigation among Chinese university graduates. *Journal of Vocational Behavior*,2013;83(3):561-570. <https://doi.org/10.1016/j.jvb.2013.09.003>

9. Hair JF, Sarstedt M, Ringle CM, Mena JA. An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the academy of marketing science*,2012;40:414-433. <https://doi.org/10.1007/s11747-011-0261-6>
10. Haxhihyseni E. Career guidance and its impact on graduate employability. *Polis*,2021;20:84-94. <https://doi.org/10.58944/vtkp1864>
11. Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*,2015;43:115-135. <https://doi.org/10.1007/s11747-014-0403-8>
12. Hesketh A. *The Mismanagement of Talent: Employability and Jobs in the Knowledge Economy*. OUP Oxford, 2004.
13. Hirschi A, Nagy N, Baumeler F, Johnston CS, Spurk D. Assessing key predictors of career success: Development and validation of the career resources questionnaire. *Journal of career assessment*,2018;26(2):338-358. <https://doi.org/10.1177/1069072717695584>
14. Holmes L. Competing perspectives on graduate employability: possession, position or process?. *Studies in higher education*,2013;38(4):538-554. <https://doi.org/10.1080/03075079.2011.587140>
15. Jackson D. Re-conceptualising graduate employability: The importance of pre professional identity. *Higher Education Research Development*,2016;35(5):925-939. <https://doi.org/10.1080/07294360.2016.1139551>
16. Jackson D, Tomlinson M. The relative importance of work experience, extra curricular and university-based activities on student employability. *Higher Education Research Development*,2022;41(4):1119-1135. <https://doi.org/10.1080/07294360.2021.1901663>
17. Jackson D, Wilton N. Developing career management competencies among undergraduates and the role of work-integrated learning. *Teaching in Higher Education*,2016;21(3):266-286. <https://doi.org/10.1080/13562517.2015.1136281>
18. Kelan E. Gender, risk and employment insecurity: The masculine breadwinner subtext. *Human relations*,2008;61(9):1171-1202. <https://doi.org/10.1177/0018726708094909>
19. Landin J, Alba BG, Olmo MM, Steele J. Student Employability: The Higher Education Environment, Innovating Teaching, and Future Opportunities. In *Advancing Student Employability Through Higher Education*. IGI Global, 2024, 165-179. <https://doi.org/10.4018/979-8-3693-0517-1.ch009>
20. Lent RW, Brown SD, Hackett G. Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of vocational behavior*,1994;45(1):79-122. <https://doi.org/10.1006/jvbe.1994.1027>
21. Manlagaylay MP, Añar LE. Career Development and Job Placement Services in Higher Education Institution. *Asia Pacific Journal of Social and Behavioral Sciences*,2022;20:102. <https://doi.org/10.57200/apjsbs.v20i0.302>
22. Meade AW, Craig SB. Identifying careless responses in survey data. *Psychological methods*,2012;17(3):437. <https://doi.org/10.1037/a0028085>
23. Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 2003;88(5):879. <https://doi.org/10.1037/0021-9010.88.5.879>
24. Rothwell A, Arnold J. Self-perceived employability: Development and validation of a scale. *Personnel review*,2007;36(1):23-41. <https://doi.org/10.1108/00483480710716704>
25. Schultz TW. Investment in human capital. *The American economic review*,1961;51(1):1-17. <https://doi.org/10.2307/2525048>
26. Thijssen JG, Van der Heijden BI, Rocco TS. Toward the employability—link model: current employment transition to future employment perspectives. *Human resource development review*,2008;7(2):165-183. <https://doi.org/10.1177/1534484308314955>
27. Tomlinson M. Graduate employability and student attitudes and orientations to the labour market. *Journal of education and work*,2007;20(4):285-304. <https://doi.org/10.1080/13639080701650164>
28. Tomlinson M. Forms of graduate capital and their relationship to graduate employability. *Education+ Training*,2017;59(4):338-352. <https://doi.org/10.1108/et-05-2016-0090>
29. Xin L, Zhou W, Li M, Tang F. Career success criteria clarity as a predictor of employment outcomes. *Frontiers in psychology*,2020;11:540. <https://doi.org/10.3389/fpsyg.2020.00540>
30. Zhou W, Feng Y, Jiang X. How Does Forgone Identity Dwelling Foster Perceived Employability: A Self-Regulatory Perspective. *Sustainability*,2024;16(22):9614. <https://doi.org/10.3390/su16229614>