

Education level as a catalyst: exploring the relationship between job autonomy, joy of work, and performance among low-skilled physical gig workers in Malaysia

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Abstract. The gig economy has experienced a rise due to the prominence of digital platforms and the worldwide pandemic, leading to many individuals losing their regular income and joining the gig economy. As this phenomenon expands worldwide, Malaysia is no exception. This study examines Malaysian gig work through the lens of the Job Demands-Resources Model (JD-R) by focusing on the unique aspects of job autonomy and joy of work towards the performance of precarious gig work, while considering education level as a moderating factor. Judgmental sampling was applied to locate low-skilled physical gig workers. The hypotheses were validated using the structural equation model (SEM) approach. The novelty of the study is attributed to the examination of “joy of work” among gig workers – a new aspect that is often overlooked. The results show that job autonomy, joy of work and work performance have positive significant relationships. Additionally, education level acts as a significant moderator, with higher education levels having a stronger effect on job autonomy and work performance. The insights from this study can be used by gig companies to craft unique work arrangements to achieve desirable outcomes in the growing gig economy.

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1. Introduction

In today's rapidly evolving digital landscape, the gig economy has become prominent and transformative. According to Duggan et al. (2020), the gig economy is an economic system that utilises digital online platforms to connect workers with customers. These platforms offer innovative and flexible working models, providing new opportunities for workers around the world while helping them navigate the digital economy with autonomy and adaptability. The pandemic sped up gig economy adoption due to job cuts and reduced work hours (Reynolds & Kincaid, 2023). Consequently, many individuals have turned to gig work to supplement their income or main source of income regardless of their education level. Research by Duggan et al. (2022) observed a trend that many opt for low-skilled gig work to address financial pressures, emphasising the flexibility and accessibility these roles offer across educational backgrounds. This shift signals a societal move towards alternative work arrangements to cope with economic challenges and secure immediate financial support.

McKinsey & Company predicts tremendous growth of the gig economy, with a contribution of USD 2.7 trillion by 2025, accounting for ~2% of the global economy (Ahmad, 2020). The phenomenon of growth is not limited to specific regions but is worldwide. The rapid expansion of the gig economy in countries like the United States, European nations and some Asian countries underscores its importance (Baber, 2024). In Malaysia, the gig economy is thriving, with about four million workers, or 26% of the total workforce, being freelancers (Ahmad, 2020). This indicates a substantial shift towards gig work in Malaysia, with projections suggesting that gig workers could rise to 40% of the Malaysian workforce by 2025, potentially contributing to 26% of the nation's economic growth (Rahim et al., 2021). The unique characteristics of the Malaysian gig economy highlight the necessity for further examination of this sector. Studies conducted by Uchiyama et al. (2022) and Abd Samad et al. (2023), highlight the complexities faced by gig workers in Malaysia, including issues of social protection and labour market inequality, as well as the dual aspects of their well-being. Moreover, Low et al. (2024) emphasise

the importance of refining gig worker classification and measurement tools to better understand the dynamics of low-skilled physical gig work. Given the momentous growth of the gig economy in Malaysia and its implications for workers and the broader economy, it is imperative to explore its performance and address the challenges faced by gig workers.

With the gig economy gaining foothold, there is a notable proliferation of research covering various aspects. Zooming into the micro-level perspective of gig-worker research, Watson (2021) attempted to address the definitional ambiguity of gig work and proposed a comprehensive description of gig work, along with five gig-worker profiles based on secondary characteristics. Subsequently, Behl (2021) investigated gig workers' productivity on crowdsourcing platforms and uncovered that information quality is important in fostering productivity and engagement. Johan (2022) enriched the scholarly discussion with a systematic literature review and identified job quality and work precarity as common themes among on-demand gig workers. Overall, the existing research suggests that gig work is characterised by job precarity and a lack of objective job quality, while subjective experience varies by individual and platforms.

Considering the deficiency of the existing research in examining job autonomy in gig work, we referred to the Job Demands-Resources Model (JD-R) by Bakker and Demerouti (2017) to better understand the dynamics of gig work. Gig work's demanding nature is construed as job demand, while job autonomy serves as a resource to counter it. Job autonomy pertains to the degree to which individuals have the freedom and authority to govern their work-related decisions, tasks and schedules (Clausen et al., 2022). In the context of gig work, job autonomy extends beyond conventional employment structures, empowering workers with greater control over their work lives. This autonomy typically encompasses the flexibility to choose work schedules, select job tasks and determine the intensity of work, allowing gig workers to exercise a higher degree of self-regulation compared to traditional employment arrangements (Cropanzano et al., 2023). As such, the concept of joy of work is conceived to encapsulate intrinsic motivation and positive emotions beyond job satisfaction (Zaman et al., 2020). It is timely to examine the conjoint influence that job autonomy

and joy of work have on work performance. The urge to study gig workers' work performance is ever-heightened with the gig economy being facilitated by digital platforms. The algorithmic of digital platforms consists of multifaceted elements such as efficiency and customer satisfaction to form the evaluating criteria of gig workers' performance (Duggan et al., 2020).

The current study contributes to knowledge by three means. First, it examines the impact of job autonomy on gig work performance, providing insights into gig economy sustainability. Second, job autonomy engenders a sense of empowerment and control over one's own tasks and schedule, thereby cultivating a positive psychological state called "joy of work". As such, we study joy of work as a prominent variable in gig work settings and hypothesise that job autonomy positively influences it. Third, this study considers education level as a moderator by acknowledging that gig work provides equal opportunities for all individuals regardless of educational backgrounds.

2. Research background – gig work and digital platforms

The gig economy is transforming the labour market by creating flexible work opportunities and promoting decent work. The Malaysian Government has recognised the gig economy as a new source of economic growth and is taking relevant steps to regulate it for the welfare of gig workers. Following the proliferation of the gig economy, it has received tremendous interest in academia. Although it is hailed as a new economy, a universal definition is not available, but various industry-specified interpretations exist (De Groen et al., 2017). The current study considered gig work as low-skill physical work that is mediated by digital platforms. This consideration was due to the development of gig work in Malaysia in 2012, which predominantly comprised transportation and delivery services such as ride-hailing and food delivery. More specifically, the current study limits the definition of gig work to transportation and delivery, and the administration (e.g., matching of demand, and gig workers' performance) is mediated through digital platforms.

The gig work architecture consists of three parties: the gig company, which manages the gig work through digital platforms; the customers, who search for and place orders on these platforms; and the gig workers, who deliver the services to the customers. The gig company has ultimate control of the digital platforms

in terms of access, process and rules (Schmidt, 2017). Hence, the digital platform serves as an intermediary by matching jobs, monitoring gig workers' autonomy and dependence, facilitating customer-worker interaction, and improving operational efficiency.

The viability of the gig economy platforms depends largely on effective human resource management, including worker retention and performance (Jabagi et al., 2019). A gig company that fails to attract and retain sufficient gig workers will risk its survival and jeopardise the gig economy's viability. Using digital platforms, the gig company has little to no supervision of the workers. In contrast, conventional employment typically involves human supervisors who monitor and motivate the workers, as well as providing social support. Therefore, studying gig workers' attitudes, behaviours and performance in digital platforms is vital to determining the viability of the gig economy.

3. Literature review and hypotheses development

Job Demands-Resources model (JD-R). The Job Demands-Resources (JD-R) model was developed by Demerouti et al. (2001) to understand the interrelations between job characteristics, job resources and work outcomes in conventional work settings. Importantly, Demerouti et al. (2001) originally proposed the JD-R model as a framework for understanding the development of burnout in the workplace. Job demands refer to the physical, psychological and emotional challenges inherent in the job, while job resources are the factors that help employees cope with job demands for optimal job performance (Bakker and Demerouti, 2017). They expounded that continuous exposure to a hazardous working environment leads to physical fatigue, limits cognitive ability and engenders negative emotions. Job demand predisposes employees to work stress and negative outcomes, affecting the performance of employees and gig companies alike. Nguyen-Phuoc et al. (2023) further explained that employees with high levels of resources would be able to cope better under demanding conditions. From the gig work perspective, job demand relates to demanding workload, time pressure schedules and precariousness, while job resources entail factors like autonomy and accessibility to digital platforms. JD-R offers a relevant theoretical lens to examine the nature of low-skill physical gig work such as transportation and food delivery (Nguyen-Phuoc et al., 2023). It suggests that, when job demands are high and job resources are low, gig workers are more

likely to experience negative health outcomes such as stress and burnout. When job demands and resources are both high, gig workers experience positive outcomes like satisfaction, engagement and productivity.

Work performance. The uniqueness of gig work such as short-term engagement, freelancing and independent work arrangements has differentiated it from conventional work settings in terms of employer–employee relations and work performance. The variations of gig work performance vary according to industry, work conditions and experiences. Gig work performance generally refers to how effectively and efficiently gig workers complete their tasks or projects (De Stefano, 2015; Manyika et al., 2016). Typically, gig work performance is assessed based on specific job requirements, including meeting deadlines, effectively communicating with customers, and delivering the desired results within an agreed-upon scope and budget (Wood et al., 2019).

Additionally, work performance may include gig workers' ability to build and maintain a positive reputation and relationships with customers. This would impact their future job opportunities and earning potential in the gig economy. In most cases, performance in the gig economy is achieved by setting the targeted levels and the requester's feedback rating. To better understand the measures for gig work, Jabagi et al. (2019) classified gig workers based on skill level (low-skilled vs high-skilled) and work delivery (physical or virtual). After analysing gig workers' profiles in Malaysia, the study focuses on low-skilled physical gig workers, such as food delivery, goods delivery, and transportation, mediated by digital platforms. Intrinsically, gig workers are evaluated by requesters or customers through online rating systems (Rosenblat et al., 2017). Meanwhile, the gig organisations observe the gig workers' performance remotely through digital platforms for coordination and monitoring purposes (Lee et al., 2015).

Bakker and Demerouti (2018) explored the JD-R model in a sample of temporary agency workers with gig workers. They found that high job demands, such as high workload and role ambiguity, were associated with reduced work engagement and job satisfaction. Conversely, job resources, such as social support and opportunities for skill development, mitigated the negative impact of job demands and improved work performance. The JD-R model offers some insights into understanding the specific job demands and resources in gig work that impact work performance (Nguyen-Phuoc et al., 2022). The proceeding sections relate job autonomy and joy of gig work to work performance with hypothesised interrelationships from the purview of the JD-R model.

Job Autonomy. Gig work is often characterised as temporary or freelance employment and is widely associated with flexibility and autonomy, distinguishing it from conventional employment arrangements. Job autonomy, a key feature of the gig economy, refers to the extent to which individuals exercise independence, freedom and discretion in scheduling work and determining how tasks are performed (Theurer et al., 2018). Hackman and Oldham (1976) defined job autonomy as the extent to which a job allows workers to make decisions. Shapiro (2018) expanded this definition by contextualising autonomy in gig work, highlighting it as the ability for workers to choose when to work and which job offers to accept or reject. This is particularly relevant for low-skilled physical gig work conducted through digital platforms.

Job autonomy in gig work has been linked to various positive outcomes. It has been shown to enhance job satisfaction and well-being by granting workers greater control over their work lives, thereby reducing stress and promoting feelings of competence (Wan et al., 2024). Furthermore, autonomy empowers gig workers to make decisions that optimise productivity, leading to improved work performance (Morgeson & Humphrey, 2006).

According to JD-R theory, autonomy is one of the most important resources to alleviate job demands and reduce potential work-related risks (Bakker & Demerouti, 2017). Additionally, it stimulates employees' creativity and innovative performance (De Spiegelaere et al., 2016), enhances work efficiency and job satisfaction (Schlachter et al., 2018), and eases job burnout and emotional exhaustion (Wang et al., 2019). By considering all these factors, H1 is developed:

H1: Job autonomy enhances work performance among gig workers.

Joy of work. The concept of joy in gig work is relatively underdeveloped and warrants further scholarly exploration (Kuhn & Galloway, 2019). Tracing back, Bakke (2010) classified it as intrinsic motivation that fuels success beyond limits for an overarching purpose. Joy of work differs from job satisfaction in the origin of emotional feeling. Joy of work arises from the employees themselves, while job satisfaction is influenced by the organisation's ability to create circumstances that promote employee happiness (Peccei & Van De Voorde, 2019; Di Fabio & Kenny, 2019). This distinction is significant, as joy of work embodies a self-determined emotional state, aligning closely with the concept of intrinsic motivation, whereas job satisfaction often reflects the fulfilment of extrinsic rewards (Ryan & Deci, 2000). Sheridan (2013)

claimed that joy represents the highest standard for how individuals feel about their work, which surpasses job satisfaction and work engagement. This view highlights the potential for joy of work to contribute to sustained work performance beyond mere contentment with job conditions.

The emergence of Generation Z (Gen-Z) in the workforce has shifted the work demand with their priority for autonomy at work, flexibility and mental well-being. This distinguishes Gen-Z from Generation Y (Gen-Y) as they seek greater alignment between personal values and work roles, alongside heightened expectations for technological integration in their work environment (Benitez-Marquez et al., 2022; Twenge, 2017). However, while the discussion of generational differences informs the broader context of gig work, the current study does not aim to empirically analyse these differences but rather situates the rise of Gen-Z as a backdrop to the changing nature of gig work.

In the gig economy, tech-savvy Gen-Z finds greater joy in work driven by digital platforms and technological advancements (Pichault & McKeown, 2019; Scholz, 2017). This emerging landscape positions joy of work as a salient factor for understanding gig worker performance, particularly among younger cohorts. Building on the self-determination theory (Deci & Ryan, 1985), job autonomy is posited as a key antecedent to joy of work, as greater autonomy satisfies intrinsic psychological needs, thereby fostering positive emotional states that enhance work outcomes.

Taken together, it is proposed that joy of work can mediate the relationship between job autonomy and work performance. This suggests that job autonomy, by fostering joy of work, indirectly contributes to improved work performance. In other words, the positive effects of job autonomy on work performance are, in part, explained by the mediating role of joy of work. The intricate relationships of joy of work in the gig economy have suggested the following hypotheses:

H2: Job autonomy enhances joy of work among gig workers.

H3: Joy of work positively relates to work performance among gig workers.

H4: Joy of work mediates the relationship between job autonomy and work performance.

Education level. The gig economy, once predominantly associated with blue-collar workers, has increasingly attracted white-collar workers, particularly in response to the economic disruptions caused by the COVID-19 pandemic (Pang, 2022). This shift underscores the importance of examining education

level as a moderating variable in gig work settings. Education level serves as a proxy for human capital, encompassing individuals' cognitive abilities, problem-solving skills and emotional capacities, which are likely to shape their work-related experiences and performance. In this study, education level is operationalised as the highest formal education attained by gig workers, measured on a six-point scale ranging from primary school to postgraduate degree. For analytical purposes, we categorised primary school, secondary school and foundation studies as lower education levels, while professional study, bachelor's degree and postgraduate degrees were grouped as higher education levels.

The COVID-19 pandemic has profoundly reshaped the employment landscape, accelerating the transition towards gig work across various sectors (Kramer & Kramer, 2020). The widespread job losses and economic uncertainty during this period prompted many individuals, including highly educated white-collar workers, to seek alternative income sources in the gig economy (Spurk & Straub, 2020). This phenomenon has blurred the traditional boundaries between blue-collar and white-collar work, making education level a salient factor in understanding gig workers' heterogeneity. In Malaysia, the pandemic particularly spurred the adoption of low-skilled physical gig work, such as ride-hailing and food-delivery services, as displaced workers sought flexible income opportunities amidst economic hardship (Farooq & Sultana, 2021; Keegan & Meijerink, 2022). This influx of workers from diverse educational backgrounds highlights the need to examine how education level moderates the relationship between job autonomy, joy of work and work performance.

Human capital theory (Becker, 1962) provides a foundational framework for understanding the role of education in shaping individuals' work-related outcomes. According to human capital theory, education enhances individuals' knowledge, skills and cognitive abilities, thereby increasing their productivity and economic value. Workers with higher education levels are likely to possess greater self-efficacy, problem-solving abilities and adaptability, making them less dependent on job autonomy to perform effectively. In contrast, workers with lower education levels may rely more heavily on job autonomy as a compensatory resource to navigate the demands of gig work. This aligns with the substitution hypothesis, which posits that workers with lower human capital are more likely to benefit from job resources such as autonomy, as these resources enable them to compensate for skill deficits (Bakker & Demerouti, 2017; Lorente et al., 2014).

Empirical studies (e.g., Morgeson Humphrey, 20006; Schlachter et al., 2018) have provided further evidence of the moderating role of education in shaping job-related outcomes. The study by Morgeson and Humphrey (2006) found that job autonomy had a stronger positive effect on job satisfaction and performance among workers with lower education levels, as it allowed them to exercise greater control over their tasks. Similarly, Schlachter et al. (2018) highlighted that lower-educated workers derive greater benefits from job autonomy in managing work demands, reducing stress and enhancing well-being. These findings suggest that the moderating role of education in the gig economy may extend to both affective outcomes (such as joy of work) and performance-related outcomes.

Furthermore, the pandemic context exacerbated the importance of education as a moderator, as workers with different education levels likely experienced varying degrees of job displacement and entered gig work with differing levels of preparedness. Workers with higher education levels may have viewed gig work as a temporary or supplementary source of income, whereas those with lower education levels may have relied on gig work as their primary means of livelihood. This divergence in motivations and expectations could further shape how job autonomy and joy of work influence performance across different education groups.

By integrating human capital theory, the substitution hypothesis, and empirical evidence, this study aims to provide a more comprehensive understanding of how education level moderates the relationship between job autonomy, joy of work and work performance in the gig economy. This perspective not only addresses the heterogeneity of gig workers but also offers valuable insights for designing policies and interventions that cater to the diverse needs of gig workers across educational backgrounds. This rationale gives rise to the following hypothesis:

H5: Education level moderates the positive relationship between job autonomy and work performance, such that the positive effect of job autonomy and work performance is weaker for those who have higher education levels and stronger for those who have lower education levels.

Self-determination theory suggests that individuals have psychological needs for autonomy, competence and relatedness, which relate to education level. Often, individuals with higher education levels already possess a certain degree of competence due to their academic attainment and training. Therefore, the impact of job autonomy on their work performance is less significant. In contrast, individuals with

lower education levels perceive job autonomy as a crucial fulfilment of their psychological needs. Thus, the presence of job autonomy gives them joy and an emotional level of happiness that exceeds job satisfaction. In other words, lower education led to a stronger relationship between joy of work and work performance. As such, the following hypothesis is formulated:

H6: Education level moderates the positive relationship between joy of work and work performance, such that the positive effect of joy of work and work performance is weaker for those who have higher education levels and stronger for those who have lower education levels.

The aforesaid discussion led to the development of the research framework in Fig. 1.

4. Research methodology

Data collection. Before the data collection, the researchers followed the ethical guidelines and adhered to the ethical standards set by the Research Ethics Committee of the Institute of Postgraduate Studies and Research (IPSR) at Universiti Tunku Abdul Rahman (UTAR), a private university in Malaysia. Subsequently, the sampling procedure was followed. The absence of a comprehensive sampling frame for gig workers in Malaysia justified the use of judgmental and snowball sampling techniques to reach respondents. Judgmental sampling technique empowers the researchers to exercise their judgment to select the relevant respondents based on specific criteria that are aligned with the research objectives. The focus of the current study is low-skilled physical gig workers in Malaysia. The researchers exercised their judgment by approaching gig workers who were wearing their gig companies' uniforms and with their transport displaying the logo of the gig company at their rest area during off-peak hours in the Klang Valley region of Malaysia. They were asked for their voluntary participation in the research. We explained the research objectives and ensured the confidentiality of their identity, whereby the results generated will be aggregated for academic purposes. Upon obtaining their agreement, we offered two modes of responding to the questionnaire: paper and pen, or a soft copy circulated via a link. Subsequently, we requested that they do us the favour of sharing the link among their peers, whereby, snowball sampling was applied. The quantitative data collection was completed in three months from January to March 2023. A cover letter depicting the research objective and ensuring respondents' confidentiality was appended together

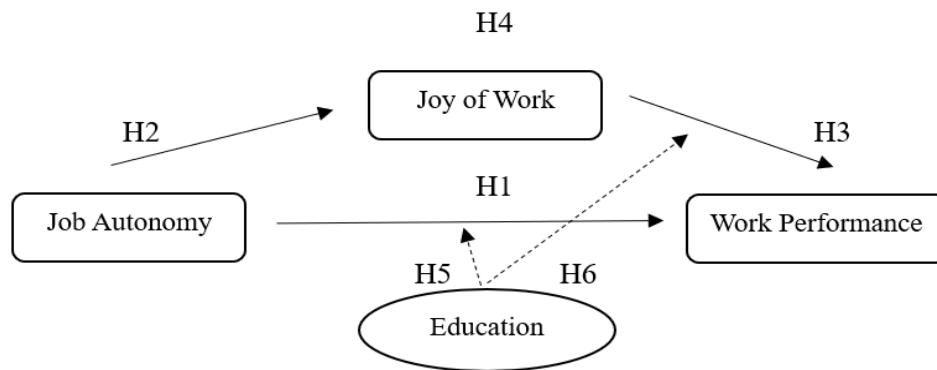


Fig. 1. Research framework

Source: own elaboration

with the questionnaire. We utilised G*Power analysis to calculate the required sample size for statistical significance. A minimum of 119 observations are required to achieve an effect size of 0.15 at 95% power level (Faul et al., 2009). According to Memom et al. (2020), there is no one-size-fits-all solution to address the sample size, and they recommended the most appropriate sample size for multivariate statistical analysis such as partial least square structural equation (PLS-SEM) is 160–300. Following G*Power Analysis and the recommended sample size, we sent out 300 questionnaires and successfully collected 213 complete responses. With a response rate of 71.0%, it is deemed adequate for the study.

Measurement items. All the measurements operationalised in this study were adopted from the existing literature. For instance, the measure of job autonomy was obtained from Morgeson and Humphrey (2006) with the Cronbach alpha value of 0.90 and sample items such as “The job allows me to make my own decision about how to schedule my work.” Meanwhile, the measure for joy of work referenced Jena and Pradhan's (2017) work; the Cronbach alpha value was recorded at 0.88, and a sample item is “I experience a sense of delight at work.” Lastly, work performance was adopted from Palvalin et al. (2015); the Cronbach alpha value is 0.84, and a sample item is “I can meet customers' expectations.” Two industry experts from the gig companies and two academics in the field assisted in the pre-testing before proceeding to the pilot test with the low-skilled physical gig workers. Modifications were made followed by expert validation. The pilot test results show reliability with internal consistency measured through Cronbach alpha with values falling between 0.63 and 0.71, indicating reliability had been ascertained. The construct validity was tested with a root mean square error (RMSE) of 0.30 to 0.41. After going through these

two levels of instrument validation procedures, the questionnaire was sent to the targeted respondents.

The questionnaire consists of two sections. Section A collects demographic information, whereas section B consists of 15 measurement items (job autonomy, 4 items; joy of work, 5 items; and work performance, 6 items) with a 7-point Likert scale on corresponding parameters with 1 indicating “strongly disagree” to 7 indicating “strongly agree”.

Common Method Bias. To alleviate the issue of CMB in this study, MacKenzie and Podsakoff's (2012) suggestions for procedural and statistical approaches were applied. We followed the procedural remedy approach recommended by Jordan and Troth (2019) and Podsakoff et al. (2012). Detailed research information was included in the cover letter to improve the response accuracy and reliability of the collected data. For the statistical approach, variance inflated factor (VIF) was executed, and the values obtained were below 3.3 as suggested by Kock (2015). CMB is not an issue in the study.

5. Quantitative results

5.1. Respondent profiles

A total of 213 valid responses were gathered. Out of these, 95.77% were males, with the majority under the age group of 21 to 25 years old (45.54%) with a secondary school qualification (48.83%) and who have been working in the gig economy for one to two years (46.95%). The details of respondents are shown in Table 1.

Table 1. Respondent profiles

Profiles	Description	Frequency	Percentage
Gender	Male	204	95.77
	Female	9	4.23
Age group	Below 20 years old	26	12.21
	21–25 years old	97	45.54
	26–30 years old	37	17.37
	31–35 years old	26	12.21
	36–40 years old	10	4.69
	41–45 years old	8	3.76
	46–50 years old	3	1.41
	51 and above	6	2.82
Education level	Primary school	5	2.35
	Secondary school	104	48.83
	Diploma	71	33.33
	Bachelor's degree	31	14.55
	Postgraduate degree	2	0.94
Gig work experience	Less than 1 year	70	32.86
	1–2 years	100	46.95
	3–4 years	37	17.37
	5 years and above	6	2.82

Source: own elaboration based on CAWI survey (n=500)

5.2. Measurement model

All three constructs under study were reflective measures. We tested the constructs' internal consistency reliability and convergent validity. The composite reliability (ρ_c) values are greater than 0.7, and Cronbach alpha values are above 0.7. Meanwhile, the outer loading of all constructs items but one was significant, with values ranging from 0.698 to 0.918. (The exception, JA1, had an outer loading below the recommended threshold and was removed during data cleaning.) The average variance extracted (AVE) values of all the constructs are above 0.5, as presented in Table 2.

The measurement model analysis further involved the assessment of discriminant validity. Hair et al. (2019) recommended the use of the heterotrait-monotrait (HTMT) criterion to assess the discriminant validity for which the degree of the indicators is distinct from others across constructs. Henseler et al. (2015) clarified that discriminant validity is established with HTMT statistics lower than 0.90 indicating the constructs are conceptually distinct. Table 3 presents the establishment of discriminant validity using the HTMT criterion, with none of the HTMT values being greater than

0.90 (Henseler et al., 2015; Gold et al., 2001). Moreover, all the values of the confidence interval do not have a value of 1 in between, demonstrating that all HTMT values are significant (Henseler et al., 2015). Therefore, it has been derived that the discriminant validity for the present study is established.

5.3. Structural model

Before proceeding to structural model assessment, lateral collinearity was examined. All VIF values were below 3.0 implying that multicollinearity was not an issue (Hair et al., 2017). Next, a bootstrapping procedure with 5,000 subsamples was executed to test the significance of the proposed relationships. Table 2 shows that job autonomy ($\beta=0.272$, $p<0.05$) and joy of work ($\beta=0.566$, $p<0.05$) are significant and positively associated with work performance. Joy of work is significant and positively associated with work performance ($\beta=0.586$, $p<0.05$). Hence, H1 to H3 are supported. For the indirect mediation analysis: joy of work mediates the relationship between job autonomy and work performance ($\beta=0.332$, $p<0.05$) with no zero-value straddle between the

Table 2. Measurement model results

Construct (Source)	Item	Outer loading	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
Job Autonomy (Morgeson & Humphrey, 2006)	JA2: The job gives me a chance to use my personal initiative or judgment in carrying out the work.	0.905	0.898	0.929	0.766
	JA3: The job provides me with significant autonomy in making decisions.	0.850			
	JA4: The job gives me considerable opportunity for independence and freedom in how I do the work.	0.859			
	JA5: The job allows me to decide on my own how to go about doing my work.	0.886			
	JOW1: I experience a sense of delight at work.	0.872			
Joy of Work	JOW2: I am optimistic with the value of my work.	0.918	0.935	0.950	0.793
	JOW3: I feel at home when working.	0.904			
	JOW4: I do convey my opinions freely.	0.850			
Work Performance	JOW5: I realise the meaning of the work that I do.	0.907	0.877	0.911	0.674
	WPI: I am able to meet customers' expectations.	0.698			
	WP2: The quality of my work output is high.	0.824			
Palvalin et al. (2015)	WP3: I am usually able to carry out my work tasks efficiently smoothly, without problems.	0.799			
	WP4: I am able to put in extra effort in my work for conducting relevant tasks related to my goals.	0.918			
	WP5: My job mainly includes tasks in which I am able to exploit my knowledge and skills efficiently.	0.850			

Source: own elaboration

Table 3. Discriminant validity (HTMT criterion)

	1	2	3	4
1. Education Level				
2. Job Autonomy	0.136 (0.038, 0.254)			
3. Joy of Work	0.092 (0.024, 0.206)	0.613 (0.465, 0.728)		
4. Work Performance	0.078 (0.022, 0.133)	0.624 (0.444, 0.752)	0.809 (0.700, 0.884)	

Source: own elaboration

lower and upper bound of the confidence interval bias-corrected (CIBC). This determines that H4 is supported. In the moderation analysis (H5 and H6), education level is hypothesised to moderate the relationship between job autonomy and work performance and between joy of work and work performance. Accordingly, the results show that H5 is supported ($\beta=0.144$, $p<0.05$) with no zero-value straddle between the lower and upper bound of the CIBC, but not H6. For the path coefficient results, joy of work yielded a higher beta value, i.e., 0.586 in comparison to job autonomy, i.e., 0.272. This reveals that joy of work has a more significant influence on work performance in the context of gig work.

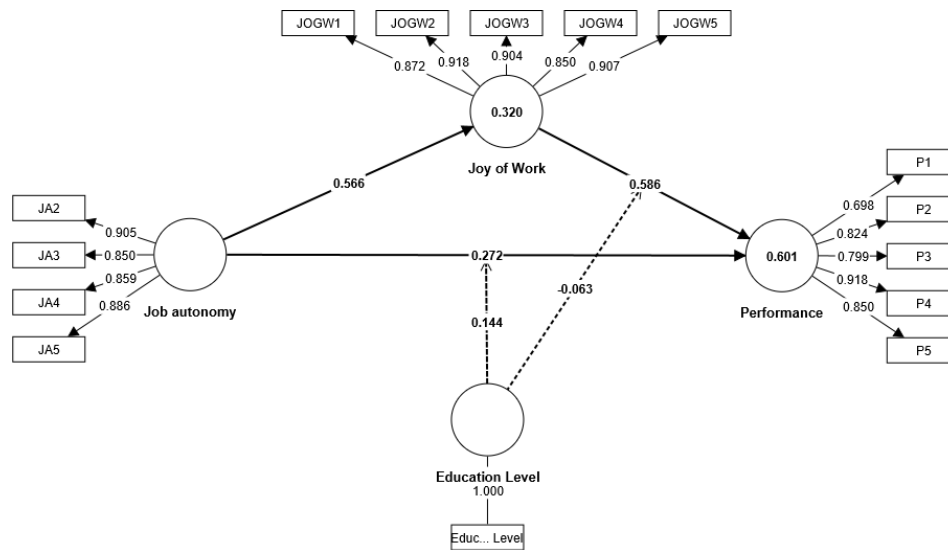
The coefficient of determination, R^2 , was assessed. Job autonomy, joy of work and education level explain 60.1% of the variances in the gig work performance. Job autonomy explains 32.0% of the variance in joy of work. Additionally, the effect size, f^2 was examined to determine the relative effect of a predictor construct on an endogenous variable. The finding suggests that a moderate-to-large amount of variance in the endogenous construct of work performance was explained by the corresponding predictor constructs of job autonomy (0.102) and joy of work (0.525) (Cohen, 1988). The detailed structural model assessment results are showcased in Table 4.

The moderation interaction graph is presented in Figure 3 to understand the significant moderation effect of education level on job autonomy and work performance. The green, blue and red lines in the interaction graph signify the moderator's high, mean and low positions, respectively. Figure 2 and Table 2 indicate that education level has a significant moderating effect on the positive relationship between

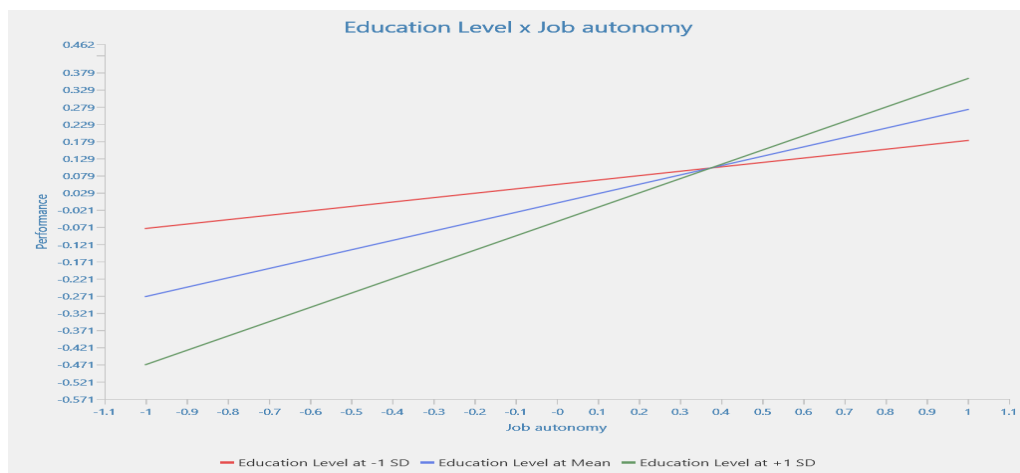
job autonomy and work performance. This suggests that higher education level has stronger positive effects on job autonomy and work performance.

5.4. Prediction-oriented assessment

Liengard et al. (2021) developed the cross-validated predictive ability test (CVPAT) as an alternative to PLSpredict for the model's predictive capabilities. Subsequently, Sharma et al. (2022) extended the CVPAT as an out-of-sample prediction approach to calculate the model's prediction error aims to determine the average loss value. The average loss value is compared to the average loss value of a prediction using indicator averages (IA) as a naive benchmark and the average loss value of a linear model (LM) forecast as a more conservative benchmark. Recently, Cheah et al. (2023) further reiterated the merit of predictive modelling and claimed that predictive modelling shall be scrutinised in the theoretical explanation of human interaction with technology such as the current study in which gig workers are monitored through digital platforms. The results show that PLS-SEM's average losses are lower than the average loss of the benchmarks (joy of work = -0.442 ; work performance = -0.357) which is expressed by a negative difference in the average loss values. Additionally, the difference of the average loss values is significantly below zero, indicating that they substantiate better predictive capabilities of the model compared to the prediction benchmarks as per Table 5. Hence, it is concluded that the hypothesised research model in Fig. 1 has predictive validity.

**Fig. 2.** Structural model assessment

Source: Extracted from Smart PLS 4.0 Software results

**Fig. 3.** Moderation interaction of education level

Source: Extracted from Smart PLS 4.0 Software results

Table 4. Structural model result for direct and indirect relationships

Hypotheses	β	t value	p values	LB	UB	VIF	f^2	R^2
H1: Job autonomy → Performance	0.272	3.413	0.001	0.145	0.402	1.826	0.102	0.601
H2: Job autonomy → Joy of Work	0.566	9.020	0.000	0.448	0.656	1.000	0.471	0.320
H3: Joy of Work → Performance	0.586	8.167	0.000	0.456	0.694	1.639	0.525	
H4: Joy of work mediates the relationship between Job autonomy and Performance	0.332	5.617	0.000	0.237	0.426		-	
H5: Education level moderates the relationship between job autonomy and work performance	0.144	1.793	0.032	0.013	0.276	1.629	0.028	
H6: Education level moderates the relationship between joy of work and work performance	-0.063	0.677	0.249	-0.203	0.106	1.456	0.005	

Source: own elaboration

Table 5. CVPAT- PLS-SEM vs Indicator Average (IA)

	Average loss difference	t value	p value
Joy of Work	-0.442	3.189	0.002
Performance	-0.357	2.894	0.004
Overall	-0.399	3.177	0.002

Source: own elaboration

6. Discussion and conclusion

The advancement of technology has enabled the growth of the gig economy within the digital economy. During and post-pandemic, gig work was a silver lining for many individuals amidst the economic challenges. Simultaneously, there is an optimistic projection of the significant contribution of the gig economy to national income. This study investigated the core features of gig work, i.e., job autonomy, and associated it with joy of work and education levels to uncover the intricate relationship with work performance. The results reveal that job autonomy positively affects work performance; likewise, joy of work displays similar influence, but to a greater extent than job autonomy. The findings are consistent with Ulrych's (2022) assertion that job autonomy is one of the job characteristics to improve work performance in the millennial workplace. Our research findings share some similarities with the works of Wood et al. (2019) and Duggan et al. (2023), in which the use of application algorithmic in gig work reveals a positive influence of job autonomy on work performance. Linking these together, it follows that job autonomy is a significant work performance predictor, be it in conventional work settings or gig work contexts. Earlier discussions illustrate that joy of work is a higher emotional level arising internally within employees. It was found that joy of work leads to greater positive work performance and mediates the relationships between job autonomy and work performance. These relationships are attributed to the fact that happiness at work produces Mathew effects in a higher motivation level, more intense commitment to tasks and, thus, improved work performance. According to Zaman et al. (2020), joy of gig work largely affects job autonomy and job characteristics concerning self-determination theory (SDT). Work autonomy forms one of the dimensions of self-determination that leads to joy of work. Job autonomy leads to increased joy in work, which in turn enhances work performance. The impetus within joy of work mediates the relationship between job autonomy and work performance.

Given the no-to-low barrier to entering the gig economy, all levels of individuals who desire some financial income have participated in the gig economy. The findings reveal the significant moderation effect of education level on job autonomy and work performance but not on joy of work and work performance. The findings contradict the claim of human capital theory that individuals with higher education levels have a greater chance of developing more skills and abilities, thereby making them less dependent on job autonomy to work well.

7. Implications

The study provides theoretical contributions and managerial implications. The JD-R model could be expanded to the contemporary workforce such as gig workers. Bauer et al. (2014) highlighted that the JD-R model is an occupational stress model that suggests strain is a response to an imbalance between demands on the individual and the resources that the worker possesses to deal with those demands. Likewise, job autonomy stems from job resources that could positively impact the performance of gig workers amid the demanding work schedule.

Meanwhile, the moderation findings offer a nascent perspective to the body of knowledge that individuals with higher education levels demonstrate lower dependency on job autonomy to increase work performance. This is an auxiliary finding conforming to human capital theory. In the perspective of low-skilled physical gig work, gig workers who possess higher education will be less likely to increase their work performance, for they may have already developed the necessary skills and abilities to work well. Gig workers with lower education levels are more reliant on job autonomy to increase their work performance.

The results have significant implications for management. Gig companies are alerted to the presence of joy in work, as it drives work performance. The management levels of gig companies shall be made aware that a lack of individual aspirations among workers may

hamper the success of gig companies. Given that education level has a role to play in the relationship between job autonomy and work performance, gig companies are suggested to tailor different levels of job autonomy based on the gig workers' education profiles. Also, gig companies could create a culture that engenders pride across the company. According to Stanford (2017), among gig workers, feeling authentic moments of joy stimulates the sense of explicit purpose and the drive to achieve success. To tag the significant impact of joy of work, gig companies are suggested to encourage gig workers to express their joy through their own experiences. Kuhn and Galloway (2019) added that joy of work can substantially augment organisational success through high involvement at work and improved work performance.

8. Limitations and future research recommendations

This paper has several limitations that should be considered when interpreting the findings. First, the data were primarily collected from the central region of Peninsular Malaysia, specifically the Klang Valley. This geographical concentration limits the generalisability of the findings to other regions within Malaysia, such as East Malaysia (Sabah and Sarawak), as well as to other nations. Future research should aim to expand the geographical scope of data collection to encompass a more diverse representation of gig workers across Malaysia, allowing for comparative analyses between regions.

Second, this study employed a cross-sectional design, which provides a snapshot of the gig economy at a single point in time. While this approach offers valuable insights, it does not capture the dynamic nature of gig work or the changes in performance over time. Future studies could benefit from adopting a longitudinal approach to track the evolution of gig workers' experiences and performance over an extended period. This would provide a more nuanced understanding of the long-term effects of gig work.

Third, the study focused on only two core dimensions of gig work in relation to work performance. While these dimensions are important, they do not encompass the full range of factors that can influence gig worker performance. Future research could explore the role of other psychometric elements, such as job motivation and work-life balance, as well as incorporate relevant theories like the Job Characteristics Model and Spillover Theory,

to provide a more comprehensive understanding of the determinants of work performance in the gig economy.

Fourth, despite the rationale for using education level as a moderator, work experience in gig work may serve as an alternative or complementary measure of human capital, particularly in the context of low-skilled physical gig work. Future research could further explore the role of gig work experience as a moderator being an alternative or complementary measure of human capital, particularly in the context of low-skilled physical gig work. This may offer a more direct measure of domain-specific human capital and provide additional insights into how accumulated experience influences gig workers' performance, job satisfaction and well-being outcomes.

In addition to expanding the scope of the study, future research could also benefit from employing a probability sampling technique or utilising a weighted PLS (WPLS) algorithm to enhance the rigour and representativeness of the findings (Low et al., 2021). Furthermore, multi-group analysis (MGA) could be used to compare low-skilled and high-skilled gig workers, providing valuable insights into the differences and similarities between these two groups.

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