

Faculty of Business

**The Role of Psychological Capital and Employee Engagement in
Determining Organisational Citizenship Behaviour in the Industrial
Revolution 4.0 Era: Transfer of Training as a Mediator**

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number HRE2019-0571.

Signature:

Date: 6 October 2020

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A saying goes: "If you think life is a bed of roses, that is because someone held onto the thorns to grant you smooth passage." I believe this remains the perfect representation of the efforts and sacrifices people undergo to advance one's interest.

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Abstract

Industry Revolution 4.0 offers vast potential in encouraging sustainable growth. Therefore, policymakers in Sarawak have instituted strategic plans to harness Industry Revolution 4.0 in congruence with the national agenda for sustainability. However, little emphasis is placed on workforce readiness to embrace change- particularly among youth who are most vulnerable yet increasingly important in steering the economic growth. Nevertheless, failure to transfer training outcomes to the workplace results in employers' hesitation to provide training. Effective transfer of training hinges on the right competencies and exhibition of the right psychological states. Therefore, this study seeks to examine the effects of psychological capital and employee engagement in determining the transfer of training and organisational citizenship behaviour among youth participants of Industry Revolution 4.0 in Sarawak. The study further examines the mediating effects of transfer of training on these relationships to uncover the role of job resources in role crafting, represented by organisational citizenship behaviour which is beneficial to the employee and its organisation.

Data collected from 251 working youth in Sarawak who were trained in Industrial Revolution 4.0 initiatives encompassing areas of digital solutions, soft-skills, and Technical and Vocational Education and Training (TVET) was analysed using the Partial Least Squares Structural Equation Modelling (PLS-SEM) technique. Transfer of training was found to mediate the relationship between psychological capital and organisational citizenship behaviour among youth participants of Industrial Revolution 4.0 in Sarawak.

To the best knowledge of the candidate, this study is the first to incorporate digital competency into the transfer of training construct and provided psychometric properties of the developed scale. Besides, in attempt to address deficiencies in the Job Demands-Resources Theory, B&B Theory, and the Kirkpatrick's Training Evaluation Model, psychological capital, employee engagement, transfer of training (as a mediator), and organisational citizenship behaviour are integrated into a single model.

This study offers managerial and socioeconomic implications. First, organisations may be enlightened on digital competencies required and aid calibration of training curriculum. Moreover, organisations may be convinced to invest in pre-training psychological capital intervention to boost rate of training transfer. Policymakers may formulate policies that will establish youth conviction in economic participation, such as training subsidies and tax exemption for companies, as well as educational channels. Third, the digital transformation across economic sectors must be complemented with skilled and adaptable work talents.

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CHAPTER ONE: INTRODUCTION

Industrial Revolution 4.0 in its velocity, scope, and systems impact is radically redefining politics, various industries and the human race (Schwab 2016; Galati and Bigliardi 2019). The genesis of 'Industrial Revolution 4.0' can be traced back to the 2011 Hanover Fair in Germany, where a strategic initiative called 'Industry 4.0' characterised by cyber-physical systems based on knowledge integration and heterogenous data was introduced (Rojko 2017; Szalavetz 2019; Galati and Bigliardi 2019). Industrial Revolution 4.0 offers substantial promise in ameliorating economic, environmental and living standards (Schwab 2016). Challenges in terms of feasibility and social acceptance must be addressed (Kadir, Broberg, and Conceição 2019; Horváth and Szabó 2019) to establish the complex synergy between humans, machines, and data needed for successful implementation of Industrial Revolution 4.0 (Galati and Bigliardi 2019; Raj et al. 2019).

Social acceptance was challenged in past industrial revolutions which resulted in labour market polarisation (Brynjolfsson and McAfee 2011; Müller 2019). Industrial Revolution 4.0 is equally unexempted from socioeconomic perils and thus, may compromise the degree of social acceptance (Schwab 2016; Kovacs 2018; Galati and Bigliardi 2019; Müller 2019). Citing rampant youth unemployment issues as one of the reasons that slows down the capacity for the adoption of Industrial Revolution 4.0 (Kovacs 2018), youth, as beginners in their respective occupational trajectories, are in dire need of training opportunities.

Feasibility, on the other hand, extends beyond technical areas, such as infrastructure, computational systems, and physical components (Kadir, Broberg, and Conceição 2019) but rather concerns the competence of the workforce. Work talents capable of augmenting requisite skills, knowledge, and attitude (termed digital competencies in this study) to work along digital technologies will thrive under this new wave of industrial revolution (World Bank Group 2016; Raj et al. 2019). In other words, digital competencies encompassing intercultural, creative, critical, and autonomy dimensions are imperative in securing technical feasibility and enabling employees to flourish at work (Ala-Mutka 2011; Colbert, Yee, and George 2016; Murawski and Bick 2017; Alam et al. 2018; Müller 2019; Ghobakhloo 2020). However, the exact competencies required, and the readiness of the workforce remains unestablished (Horváth and Szabó 2019). This indicates that workforce competency is imperative on the cusp of Industrial Revolution 4.0.

Organisations have become increasingly convinced to adopt Industrial Revolution 4.0 initiatives to generate long-term returns in the form of increased productivity, profits, and competitive advantage (Dalenogare et al. 2018; Horváth and Szabó 2019); yet, many fail to

recognise the value in training provision- a potentially effective tool in mitigating challenges in feasibility and social acceptance. Training is not only a vital job-resource for employees to develop competencies (Gontkovičová, Mihalčová, and Pružinský 2015), but also pivotal for effective organisational functioning (Aladwan, Bhanugopan, and D'Netto 2015; Kohlbacher 2017; Memon, Salleh, and Baharom 2016). Organisational efforts in equipping the workforce with required competencies may help to address feasibility and social challenges by bridging skill discrepancies (Pacchini et al. 2019; Galati and Bigliardi 2019). Human resource development practitioners estimate that merely 10 to 15 % of training are effectively transferred to work over the past two decades (Kontoghiorghes 2014; Roussel 2014). Otherwise speaking, organisations are discouraged from training provision because the true yield of their investment in trainings remain unknown (Blume et al. 2010; Kontoghiorghes 2014). Most often, personal motivations result in transfer failures (Elliott, Dawson, and Edwards 2009).

Malaysia's quest in harnessing Industrial Revolution 4.0 to improve its socioeconomic standards (Economic Planning Unit 2016; Ministry of Economic Affairs 2019) is equally challenged in terms of workforce readiness. According to a market research by Randstad, 82% of Malaysian employees felt that employers are not providing adequate training opportunities to equip them with essential skills for the digital climate (*Randstad* 2019). In fact, merely 18% of the Malaysian workforce are highly skilled. Malaysian employers hesitate in the provision of training opportunities due to training transfer failure, fear of turnover, or deem trainings beyond employees' current work-scope to be unnecessary (Training Workforce 2017). Due to disequilibrium between both employees' and employers' needs (Malaysian Investment Development Authority 2019), the symbiotic relationship between employees and their organisations are violated. This will threaten the organisations' capacity in securing digital dividends.

In face of deep frustrations on the poor state of digital infrastructure and economic stagnancy albeit being one of best GDP contributing states in Malaysia (Singh 2017; Aliman 2018), the state government of Sarawak launched its Digital Economy Strategy 2018-2022 to eradicate socio-economic divide, increase youth employment, and accelerate economic viability (State Service Modernisation Unit 2017). The aforementioned issues of feasibility and social acceptance is unsparingly prevalent in Sarawak. As the number of skilled workers in Sarawak is inadequate to meet the demands for a digitally-driven economy (Jee 2019), concerns on the inadequacy of future-proofing the workforce by hiring new employees were raised (Ling 2019). Reskilling and upskilling the Sarawakian workforce is seen as an inevitable task (Ling

2019). It is therefore imperative to scrutinize the long-lingering issue of training transfer failures.

In both practical and theoretical domains, persistent training transfer failure remains a concern (Baldwin, Ford, and Blume 2017). From a theoretical perspective, it is understood that transfer problems originate from the lack of personal motivation (Elliot, Dawson, and Edwards 2009). To gather a better understanding on the phenomena, several gaps in literature must be addressed. First, Grover et al. (2018) and Bruning and Campion (2018) respectively raised concerns on the vague understanding of the influence of personal resources (*PsyCap*) on job-resources (*TOT*) and the pathway resulting in approach role crafting, represented by *OCB*. Second, the Job Demands-Resources Theory insufficiently addresses psychological processes (i.e. cognition and motivation) that elicit demands and resources (Bailey et al. 2017; Bakker and Demerouti 2017). Third, in the era of Industrial Revolution 4.0, digital competencies have been scarcely identified for practical use (Janssen et al. 2013; Murawski and Bick 2017). This corresponds to inadequate contextualisation of *TOT* (Reio et al. 2017). Lastly, weak understanding on the implications of psychological capital (Nolzen 2018) and engagement (Bailey 2016; Bailey 2017) on human resource practices contributed to transfer of training complications (Baldwin, Ford, and Blume 2017).

Therefore, this study attempts to examine the role of psychological capital (*PsyCap*), employee engagement (*EE*) in determining organisational citizenship behaviour (*OCB*), and the mediating effect of transfer of training (*TOT*) on these relationships among youth participants of Industrial Revolution 4.0 in Sarawak.

1.1 Background

1.1.1 Industrial Revolution 4.0- An Overview

Industrial Revolution 4.0, otherwise known as Industry 4.0 or the digital revolution, refers to an innovative initiative characterised by a constellation of technologies with extreme digital connectivity and cyber-physical systems (Dalenogare et al. 2018; Horváth and Szabó 2019). In general, Industrial Revolution 4.0 technologies are identified as, but non-withstanding to Internet of Things (*IoT*), big data analytics, cloud computing, artificial intelligence, additive manufacturing, advanced materials, augmented reality, autonomous robots, simulation, vertical and horizontal integration (Rojko 2017; Özdemir 2018). Additionally, the integration of innovative business models, technical processes, and virtualisation of the real world form equally crucial elements of Industrial Revolution 4.0 (Rojko 2017).

Organisations worldwide are increasingly convinced towards harnessing Industrial Revolution 4.0 to generate long-term competitive advantage and dynamic capabilities in their respective organisations (Horváth and Szabó 2019). Similarly, the Industrial Revolution 4.0 notion captivated interests from government bodies due to its potential in proliferating economic performance, environmental sustainability and societies' living standards (Dalenogare et al. 2018). The following sections 1.1.2 and 1.1.3 shall discuss the significance of the Industrial Revolution 4.0 initiative to Malaysia, and particularly, Sarawak.

1.1.2 Malaysia's Pursuit for Sustainable Growth and the Industrial Revolution 4.0 as a Catalyst

Malaysian policy-makers pledged to steer inclusive growth and sustainable development of the nation in the Eleventh Malaysia Plan (Economic Planning Unit 2016). Sustainable development encompasses social progress, economic growth, and environmental protection (Svenfelt et al. 2019). Any deficiency in these dimensions will hinder common progress. "Pillar II: Enhancing inclusive development and wellbeing", "Pillar IV: Empowering human capital", and "Pillar VI: Strengthening economic growth" serve among the six pillars of the Eleventh Malaysia Plan (Economic Planning Unit 2016). Essentially, the strategic actions underlying these pillars are central to the interest of this study. In a relatively earlier stage, the state government of Sarawak pledged to foster digitalisation to eradicate socio-economic divide, increase youth employment, and accelerate economic viability in its Digital Economy Strategy 2018-2022 (State Service Modernisation Unit 2017). These aims are congruent to the pillars of the revised Eleventh Malaysia Plan (Economic Planning Unit 2016).

Underpinned by common equity, Malaysian citizens ought to receive their fair share in economic participation and inclusive development (Economic Planning Unit 2016). The fourth pillar evinces the creation of "skilful, knowledgeable, and innovative" human capital by improving access to quality education and training (Economic Planning Unit 2016). According to Bekhet and Latif (2018) and Bank Negara Malaysia (2019), Malaysia is strongly reliant on capital and labour which accounts for approximately 70% of GDP growth. Contrarily, multi-factor productivity exhibited decelerating patterns (Bekhet and Latif 2018). Structural reforms to strengthen economic growth are expected to intensify by harnessing Industrial Revolution 4.0. Strategic actions include technological adoption and innovation, developing knowledge-intensive content and train skilled workforce (Bahrin et al. 2016; Economic Planning Unit 2016; Bekhet and Latif 2018). Consequently, dependency on capital and labour inputs can be reduced while productivity levels are proliferated (Bahrin et al. 2016).

Most recently, in the Shared Prosperity Vision 2030 (Ministry of Economic Affairs 2019), the Malaysian government expressed will to restructure the economy into a progressive, knowledge-based economy with full community participation, besides addressing inequalities in the society. Nevertheless, these objectives remain challenged by high numbers of low value-added industries with low technology adoption rates, which in turn, decelerates diversification of the Malaysian economy. Moreover, the Shared Prosperity Vision blueprint highlighted that 72.8% of the Malaysian labour market consists of semi- and low-skilled employees, where minimal efforts have been invested to upskill workers, therefore resulting in income disparity between labour and capital (Ministry of Economic Affairs 2019). Recent advancements in technologies have gradually displaced the need for low- or semi-skilled workers (Aghion, Jones, and Jones 2017; O'Mahony, Vecchi, and Venturini 2018; Acemoglu and Restrepo 2020). Therefore, upskilling is essential to ensure the viability of the Malaysian workforce in light of increasingly capital-intensive economies (Ministry of Economic Affairs 2019).

To the best knowledge of the candidate, existing studies in Malaysia characterised by the Industrial Revolution 4.0 mainly focus on technical implementation (e.g. Bahrin et al. 2016; Mohamad et al. 2018; Ooi et al. 2018), while studies on human capital readiness, economic impact and governmental initiatives are merely conceptual (Abdullah et al. 2017; Idris 2019).

1.1.3 Digital Economy Footprints in Malaysia and the Case for Sarawak

Industry 4.0, however, is not Malaysia's first attempt in fostering a digital economy. In 1996, Tun Dr. Mahathir bin Mohamad launched the Multimedia Super Corridor (MSC) as a platform to nurture growth of high-technology firms and attract direct investments (MDEC 2019). MSC was seen as Malaysia's stepping stone into a society characterised by information and knowledge (Reid 1998). The Malaysia Digital Economy Corporation Sdn. Bhd. (MDEC) was established in that same year to initiate Malaysia's digital transformation and govern MSC's developments (MDEC 2019).

Prior to the 14th General Elections, MDEC's digital initiatives were rather confined to technocrats and conspicuous to the public eye (D. B. Abdullah et al. 2017). Furthermore, the former Malaysian government placed minimal emphasis on Industrial Revolution 4.0 initiatives with evidence of omission from the initial Eleventh Malaysia Plan (Economic Planning Unit 2015). Therefore, the paucity of literature on Industrial Revolution 4.0 related issues in Malaysia (Mohamad et al. 2018) is not surprising. However, the notion of Industrial Revolution 4.0 is strongly reflected in the Mid-Term Review of the Eleventh Malaysia Plan (Economic Planning Unit 2016) following Tun Dr. Mahathir's regain of premiership (Toh 2018). Subsequently, a national policy on Industry 4.0 (*Industry4WRD*) was released in October 2018 (Ministry of International Trade and Industry 2018).

Sarawak, the only Malaysian state with a long-term, systematic, and independent digital economy blueprint- the Digital Economy Strategy 2018-2022- is set to position itself at the forefront of digitalisation initiatives in Malaysia (Digital Transformation 2018). The economic transformation agenda was conceived for three reasons, namely, poor digital infrastructure development, a stagnant wealth distribution among Sarawakian households despite being one of the largest GDP contributors to the Malaysian economy, and a pressing need to diversify its economic activities to reduce the state's reliance on non-renewable energy (Singh 2017; Jee 2019). Distinct from other Malaysian states, the state government of Sarawak established an independent body, Sarawak Multimedia Authority to govern the state's digital economy strategy and pledged its own funds for the initiative (Singh 2017).

To the best knowledge of the candidate, this study is the first to be characterised by the Industrial Revolution 4.0 landscape in Sarawak focusing on youth. The candidate suggests that the study is highly relevant to Sarawak as the state is in active pursuit of Industrial Revolution 4.0. Furthermore, the awareness of the initiative and talent development are indispensable to warrant successful transformation (Lam 2020).

1.1.4 Digital Perils, Youth Unemployment and Value of Youth to Economic Development

Technological advancements without socioeconomic improvements may weaken social cohesion, and subsequently, result in reduced levels of social acceptance (Horváth and Szabó 2019). Based on historical lessons, this new wave of industrial revolution may polarise employment structures via technological unemployment (Pol and Reveley 2017), downward wage (World Bank Group 2016; Shambaugh and Nunn 2017), leading to structural unemployment (Prattis 1982; Jackman and Roper 1987; Otoiu and Titan 2012; Aysun, Bouvet, and Hofler 2014; Fadinger and Mayr 2014; Agénor and Lim 2018), burnout (Koloc 2013; LaGrandeur and Hughes 2017; Bregman 2017) and inequalities (Smollan 2015). These phenomena indicate the dawn of grand societal challenges.

In a piece of literature by Kurt (2019), youth are addressed as one of the most vulnerable sections of the society in face of Industrial Revolution 4.0. Evidently, the International Labour Organisation suggested that youth unemployment is a major challenge hitting economies across the globe (International Labour Organisation 2019). As exhibited in *Figure 1*, youth unemployment rates among 15 to 19-year-old Malaysians, and 20 to 24-year-olds in 2017 were five and three times higher respectively, as compared to the overall unemployment rate of 3.4% in Malaysia (World Bank Group 2018). According to the World Bank Group (2018) and Economic Planning Unit (2016), the youth unemployment rate in Malaysia is largely attributed to mismatch of skills.

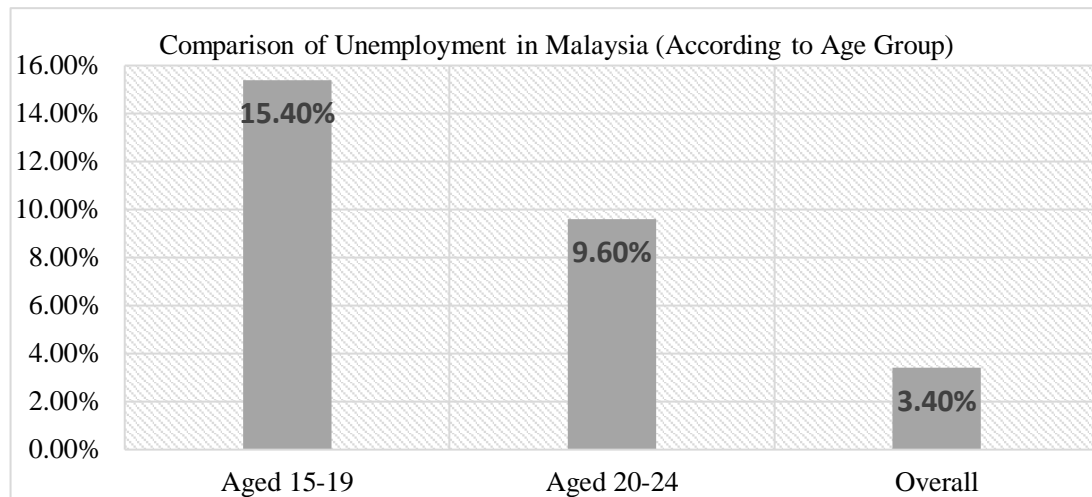


Figure 1: Unemployment in Malaysia

Source: World Bank Group 2018;

Needless to say, the youth, as beginners in their occupational trajectories- are most vulnerable in face of rapid digitalisation as they lack resources, namely competence, identity, income, or networks required to optimize performance in dynamic work (Demerouti, Peeters, and van der Heijden 2012; Upadyaya and Salmela-Aro 2017; Salmela-Aro and Upadyaya 2018). The youth is further disadvantaged by inexperience, labour market information asymmetry, and inability to communicate effectively to employers (Mohd Ibrahim and Mahyuddin 2016). Youth unemployment often result in psychological disillusionment, anxiety, stress, and ultimately, withdrawal from economic participation (Institute for Labour Market Information and Analysis 2019; Hällsten, Edling, and Rydgren 2017; Kovacs 2018). Therefore, dearth in youth resources will exacerbate socioeconomic challenges via structural youth unemployment if left unaddressed (Economic Planning Unit 2016; Armstrong et al. 2018; Ministry of Finance Malaysia 2019).

Nevertheless, youth unemployment is not the sole challenge in fostering Industrial Revolution 4.0. In a joint study by Workday and IDC, two in every five Malaysian employees were found to feel threatened by rapid digitalisation (Workday IDC 2018). In fact, the Khazanah Research Institute suggested that 70% of semi-skilled jobs and 80% of low-skilled jobs in Malaysia are prone to digitalisation risks (Tan 2017). This is particularly agonizing as Malaysian jobs are mostly concentrated in low and semi-skilled tiers as a result of domestic industries' inclination towards cost-efficiency and cheap labour (Bank Negara Malaysia 2017). Over 37% of Malaysian employees perceive themselves as incompetent to thrive in a digital landscape (Syed 2018).

Personal development trajectories have become increasingly daunting and unpredictable (Lyons, Schweitzer, and Ng 2015). In Deloitte's global survey (2018); 52% of youth claimed rare opportunities as the main barrier in developing competencies for a decent job. Other challenges include lack of financial and practical resources (50%), information asymmetry in labour markets (33%), and weak relationship networks (31%). Scarce provision of up-skilling opportunities pestered the youth to undertake self-reliant economic arrangements to equip themselves with resources for the future of work (Mohd Ibrahim and Mahyuddin 2016; Armstrong et al. 2018). This may impose a domino-effect on employment relationships.

On the other hand, domestic industries often attribute their inability to make value chain advancements to talent shortage (Bank Negara Malaysia 2018). Ironically, 53% of organisations in Malaysia have never engaged career centres to equip their prospective employees with effective and meaningful training, thus further exaggerating workforce competency issues (Mohd Ibrahim and Mahyuddin 2016). As evidence, a report by Gallup Inc. (2017) entitled "State of the Global Workplace" attributed the primary source of employee disengagement to dispossession of personal development opportunities.

However, the above challenges serve as great reminders on the importance to align workforce competencies with changing demands. Central to historical economic progress is the notion of creative destruction (Schumpeter 1976; World Bank Group 2016). Creative destruction suggests that the resultant growth in new jobs and improvements in socioeconomic aspects will prove technological progress worthwhile (Schumpeter 1976; Alm and Cox 2007). This signals a dire need to contemplate employees' readiness. While organisations may expect to benefit from positive impact on performance, competitiveness, and commercial advantages, they must not forget that the teleology behind their existence is to enrich the society.

Empowering the youth with competencies to thrive in the new skills economy is gaining importance as baby boomers are inching close to retirement (McKay 2019). This implicates that the youth will be taking on larger roles in steering economic growth. Furthermore, efforts to attain sustainable, inclusive, and stable societies as well as averting threats are futile without inclusive development of youth (United Nations Department of Economic and Social Affairs 2018). The Department of Statistics Malaysia (2019), as reported by the Labour Department of Sarawak (2018), has estimated that youth in Sarawak accounts for 44.2% of the total working population in Sarawak, which is equivalent to 557,008 persons. The size of youth population holds significance in the context of sustainable development as they serve as determinants of workforce growth and economic pressure (United Nations Department of Economic and Social Affairs 2018). Development of youth was also highlighted in the Sarawak Digital Economy Strategy 2018-2022 (State Service Modernisation Unit 2017).

1.2 Problem Statement

Industrial Revolution 4.0 offers infinite opportunities in the pursuit for sustainability. Policymakers of Malaysia and the state of Sarawak have instituted strategic plans to harness Industrial Revolution 4.0. At the heart of prosperity and wellbeing are thriving business entities and their work talents. Domestic industries in Malaysia often attribute their inability to make value chain advancements to talent shortage (Bank Negara Malaysia 2017). Besides, employees' readiness to embrace Industry 4.0 has immensely corroded in the face of economic stressors at a global scale (Galati and Bigliardi 2019; Kovacs 2018; Pacchini et al. 2019). Youth unemployment rates in Malaysia remain elevated (World Bank Group 2018; 2019) due to skill mismatch and lack of resources. As of January 2019, youth unemployment in Malaysia has exceeded 10%- equivalent to three times the global average (Farhan 2019).

The worrying situation of youth unemployment exacerbates the mental stress experienced by employees (Kovacs 2018). According to Alam et al. (2018), only a minimal proportion of businesses are inclined to support and develop their employees' digital competence despite viewing digital competence imperative to the development of key competencies. Given minimal emphasis on workforce readiness to embrace widespread change, particularly among the youth, work talents without requisite skills to complement digital transformations are threatened by economic stressors. Evidently, two in every five Malaysian employees feel threatened by rapid digitalisation (Workday IDC 2018) and over 37% employees perceive themselves incompetent to thrive in a digital landscape (Syed 2018). The Khazanah Research Institute suggested that 70% of semi-skilled jobs and 80% of low-skilled jobs may become obsolete as this new wave of revolution hits (Tan 2017). Similarly, in Sarawak, the supply of skilled workers to match the demands of Industrial Revolution 4.0 remains at a worrying level (Jee 2019).

Despite the pressing need to equip employees with digital competencies via training, Malaysian employers are hesitating to invest in training (Training Workforce 2017). According to Mohd Ibrahim and Mahyuddin (2016), 53% organisations in Malaysia has never engaged training arrangements for their employees. This is further confirmed as an alarming 82% of Malaysian employees felt that employers are not providing adequate training opportunities to equip them with essential skills for the digital climate (Randstad 2019). This is mainly due to training transfer redundancies. Widespread disengagement issues were ascribed to dispossession of personal development opportunities (Gallup Inc. 2017; Tucker and Goodings 2017). Organisations often find themselves with diminishing returns as employees fail, or minimally transfer training outcomes to work (Elliot, Dawson, and Edwards 2009; Blume et al. 2019). However, complacency in recognising the importance of training

leads to declining commitment towards employing organisations (Gallup Inc. 2017). In other words, depriving employees from training opportunities violates the symbiotic relationship between employees and their organisations, thus further threatening the organizations' capacity in securing digital dividends.

From extant literature, it is understood that transfer problems originate from lack of personal motivation (Elliott, Dawson, and Edwards 2009). Such problem is likely to persist due to gaps in extant knowledge. First, Grover et al. (2018) and Bruning and Campion (2018) respectively raised concerns on the vague understanding of the influence of personal resources (*PsyCap*) on job-resources (*TOT*) and the pathway resulting in social expansion (*OCB*). Second, the Job Demands-Resources Theory insufficiently addresses psychological processes (i.e. cognitive processes) that elicit demands and resources (Bailey et al. 2017; Bakker and Demerouti 2017). Third, in the era of Industrial Revolution 4.0, digital competencies have been scarcely identified for practical use (Janssen et al. 2013; Murawski and Bick 2017). Lastly, weak understanding on the implications of psychological capital (Nolzen 2018) and engagement (Bailey et al. 2017) on human resource practices contributed to transfer of training complications (Baldwin, Ford, and Blume 2017).

Furthermore, due to dynamism in working environments, acquired skills, knowledge, and attitudes have only finite life. Thus, this study questions on how personal resources (PsyCap), or motivation (EE) reinforce job-resources (TOT characterised by digital competencies); thereby contribute to organisational citizenship behaviour (OCB). While studies have suggested linkages between EE and PsyCap to OCB respectively, emphasis on the individual's capacity to generate his own long-term job-personal resources as suggested by job crafting proposition is lacking. This study draws on Frederickson's B&B theory which suggests that positive emotions such as PsyCap and EE are capable of altering behavioural repertoire to generate long-term resources (TOT); its association to approach crafting characterised by social and work-role expansion (OCB) may be found. OCB is integral in the context of Industrial Revolution 4.0 due to its potential in increasing the quality of relationships (Lazazzara, Tims, and de Gennaro 2020), job efficiency, work processes, and forwarding of organisational goals (De Beer, Tims, and Bakker 2016). Furthermore, OCB was perceived as a form of organisational impact (Nik Nazli and Sheikh Khairudin 2018) which may encourage employers to invest in training opportunities.

In essence, this cross-sectional study is primarily important to the youth and their employing organisations, apart from offering economic implications and a glance on the readiness of the Sarawakian workforce to embrace digitalisation.

1.3 Research Questions

- a) How will PsyCap and EE encourage TOT among youth participants of Industrial Revolution 4.0 in Sarawak?
- b) How will PsyCap, EE, and TOT influence OCB among youth participants of Industrial Revolution 4.0 in Sarawak?

1.4 Research Objectives

The general objectives of the study are to present and test a conceptual model (see Figure 2) of PsyCap and EE in determining OCB among youth participants of Industrial Revolution 4.0 in Sarawak and the mediating effects of TOT on these relationships.

Specifically, the objectives of this study are:

- a) To examine the relationship between PsyCap and TOT and EE and TOT respectively
- b) To examine EE as the mediator in the relationship between PsyCap and TOT
- c) To examine the relationship between EE and OCB as well as PsyCap and OCB respectively
- d) To examine TOT as mediator in the EE and OCB relationship as well as the PsyCap and OCB relationship respectively.

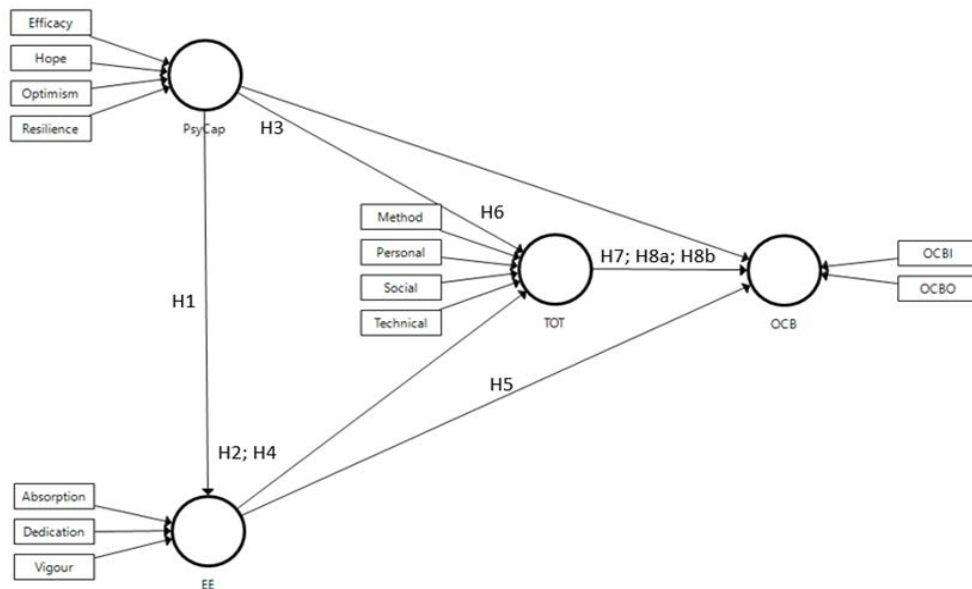


Figure 2: Conceptual Model

1.5 Potential Significance

The expected theoretical contributions of this study come in two folds. First, to the best of the candidate's knowledge, this is the first study to reconceptualise the TOT construct by incorporating "digital competencies", whose specifications have remained ambiguous in extant literature. This study posits that digital competencies form job-resources that will sustain the viability of employees in dynamic, knowledge-intensive working environments. As this study sets to take place in Sarawak- a state at the initial stages of digital adoption, the "digital competencies" shall incline towards skills, knowledge, or attitudes required to work with the basic building block of Industrial Revolution 4.0 technologies.

Concomitantly, this study is the first few literatures that brings together the constructs of PsyCap, EE, TOT, and OCB into a single model. Extant literatures often study these constructs separately (Bakker and Demerouti 2007; Messersmith et al. 2011; Beal, Stavros, and Cole 2013; Pouramini and Fayyazi 2015; Grover et al. 2018; Nik Nazli and Sheikh Khairudin 2018; Bruning and Campion 2018). By examining these constructs in a single model, a holistic understanding on the personal resources-job resources interaction and pathway leading to social expansion among youth participants of Industrial Revolution 4.0 may be obtained.

This study may be practically significant for three reasons. First, this study expects to recommend initiatives that will complement managerial practice. For example, organisations may be enlightened on competencies required to work with digital technologies. Human resource practitioners may also find this study useful to calibrate training curriculum. By understanding the influence of psychological states, organisations may be further convinced to invest in training and developing employees. This allows long-term value creation, competitiveness, and retainment of skilful work-talents. These initiatives shall respond to Colbert, Yee, and George's (2016) calling to fill in knowledge gaps on how work-talents' performance can be effectively boosted whilst avoiding pitfalls of embracing Industrial Revolution 4.0.

Second, this study may also encourage policy formulation which strengthens youth conviction and resilience in their career trajectories. Youth often lack resources, namely, competence, identity, income, or networks to optimize performance in dynamic work environments (Salmela-Aro and Upadyaya 2018). This increases their susceptibility to burnout as compared to elder employees. The Department of Statistics Malaysia (2019) and the Labour Department of Sarawak (2018) jointly estimated that 44.2% of the total Sarawak population comprises of youth. Thus, proper youth development initiatives hold significant value in flourishing the state, be it from economic, environmental, or social areas.

Lastly, this study may suggest socioeconomic implications. As suggested in the Eleventh Malaysia Plan (Economic Planning Unit 2016) and Sarawak Digital Economy Strategy (State Service Modernisation Unit 2017), Industry 4.0 initiatives are central to economic growth. It is reiterated that competent workforce is pivotal to tapping digital dividends of the Industrial Revolution 4.0. Simultaneously, a World Youth Report by United Nations Department of Economic and Social Affairs (2018) has iterated the crucial roles of youth in economic development.

1.6 Key Definitions

1.6.1 Psychological Capital (PsyCap)

Following the likes of Grover et al. (2018) and Kotzé (2018), PsyCap is perceived as a personal resource with cognitive and positive affect characteristics in this study. According to Luthans, Youssef, and Avolio (2007, 550), PsyCap represents an individual's motivated efforts and resilience to positively appraise circumstances and increase the likelihood of success. Based on extant literature, PsyCap is characterized by the following (Luthans, Youssef, and Avolio 2007, 542; Grover et al. 2018, 969; Nolzen 2018, 271): (i) self-efficacy which refers to credence possessed by an individual to undertake and direct necessary efforts to succeed in challenging work environments, (ii) optimism which is an individual's positive attribution on current or future success, (iii) hope which represents the perseverance and determination held by an individual which leads to, or, redirects the path to achieving set goals, and (iv) resilience which is the ability to sustain, retaliate, and persevere in facing setbacks and adversity to achieve desired success. Consistent with the works of Luthans and Youssef-Morgan (2017); as well as Grover et al. (2018), this study shall specify PsyCap as a higher order composite construct of the four dimensions mentioned.

1.6.2 Employee Engagement (EE)

Defined as a mindful state focused on work, EE is characterised by (i) vigour which is the extent employees find themselves bursting with energy, (ii) dedication which represents their enthusiasm towards work content and actions, and (iii) absorption which is the state where time seems to pass quickly as employees are immersed in their work (Schaufeli et al. 2002, 74; Schaufeli and Bakker 2010, 13; Bakker and Demerouti 2017, 275). This Utrecht perspective of engagement has dominated engagement-related studies (Bailey et al. 2017). In other words, engagement in this perspective signifies employees' willingness to devote time or effort in pursuing goals while fully committing themselves to work (Schaufeli et al. 2002; Schaufeli and Bakker 2010; Bakker and Demerouti 2017).

1.6.3 Transfer of Training (TOT)

TOT is traditionally defined as (i) the extent of applying training outcomes constituting of knowledge, skills, and attitude to work contexts, and (ii) sustaining them over time (Baldwin and Ford 1988). Nevertheless, recently, scholars are inclined towards viewing transfer as a chain of choices made by trainees in “discarding, maintaining, applying, or modifying” work elements (Baldwin, Ford, and Blume 2017). Human resource practitioners strongly suggest the development of digital competencies through training (Hecklau et al. 2016; United Nations Department of Economic and Social Affairs 2018). Therefore, whether digital competencies are applied at the workplace- as an indication of training effectiveness, hedges on TOT.

Responding to calls for specific contextualisation of TOT (Reio et al. 2017) and further prompted by the importance of digital competencies in the face of Industrial Revolution 4.0 to prevent an individual’s economic relevancy from becoming obsolete (Gontkovičová, Mihaľčová, and Pružinský 2015), this study seeks to examine TOT by incorporating four dimensions of digital competencies encompassing technical, methodological, social and personal areas.

1.6.4 Organisational Citizenship Behaviour (OCB)

Organisational citizenship behaviour represents a voluntary, prosocial behaviour beneficial to organisations (Bateman and Organ 1983; Organ 1988; Memon et al. 2017). In 1988, Organ suggested five indicators of good citizenship, namely: (i) civic virtue which represents an employees’ commitment to participate in an organisation’s political aspects, (ii) altruism which constitutes willingness to helping others with relevant tasks or problems, (iii) conscientiousness which refers to employees’ willingness to perform boundaryless tasks, (iv) sportsmanship where one refrains from cynicism and exhibit positivity, and (v) courtesy which refers to the employee’s proactiveness in preventing problems whilst forwarding goals and objectives. In this study, OCB is operationalised as a combination of both “individual-directed citizenship behaviour” (OCBI) or “organisation-directed citizenship behaviour (OCBO) (Williams and Anderson 1991; Chiaburu and Baker 2006; Lee and Allen 2002; Cheung 2013; Shareef and Atan 2019). Notably, these two dimensions are conceived based on Organ’s (1988) five-dimension taxonomy in such a way that courtesy and altruism are represented by OCBI, whereas conscientiousness, sportsmanship, and civic virtue are reflected as OCBO. Therefore, with respect to job crafting perspectives, OCB is operationalised as a work-role and social expansion behaviour that elicits additional job resources.

1.7 Structure of the Thesis

The remainder of this thesis is structured as follows: A review of extant literature shall ensue in Chapter 2. Chapter 3 features the research methodology, research design, sample of the study, choice of instruments, construction of the TOT-DC instrument, as well as data analysis methods incorporated in this study. Chapter 4 presents an interpretation of results from the collected data while Chapter 5 concludes the study by outlining the contributions of this study, its limitations, as well as avenues for future research.

CHAPTER TWO: LITERATURE REVIEW

This chapter shall review the underpinning theories and the key constructs of this study, namely, psychological capital (PsyCap), employee engagement (EE), transfer of training (TOT), and organisational citizenship behaviour (OCB). Thereafter, literature gaps which are fundamental to the development of conceptual framework and hypotheses of this study are identified.

2.1 Theoretical Foundations

Corley and Gioia (2011) and Stewart and Klein (2016) unanimously defined theory as interrelated principles or concepts that possess explanatory power towards real world phenomena. Whetten (1989) suggested that such explanatory power constitutes of (i) factors which can possibly explain a phenomenon of interest, (ii) relationship between the factors, (iii) dynamics which justifies the factors selected and their relationships, and (iv) contextual limits of the propositions generated from theory.

Theories are fundamental towards research studies (Wilkins, Neri, and Lean 2019). First, theory enhances the rigour and robustness of a study (Colquitt and Zapata-Phelan 2007; Stewart and Klein 2016). Second, theory allows better comprehension of research data to generate findings which are pertinent to larger frameworks of other studies (Colquitt and Zapata-Phelan 2007; Stewart and Klein 2016; Suddaby 2014; Wilkins, Neri, and Lean 2019). In other words, theory is the backbone of empirical observations (Wilkins, Neri, and Lean 2019). Thirdly, theory enables justification for research and provides significant insights for practice (Stewart and Klein 2016; Wilkins, Neri, and Lean 2019).

Given the importance of theory in research, this study shall hedge its theoretical foundations on four theories, namely, Job Demand-Resources (JD-R) theory, Broaden-and-Build (B&B) theory, Kirkpatrick's Training Evaluation Model, and the Social Exchange Theory (SET).

2.1.1 Job Demand-Resources (JD-R) Theory

First introduced as the job demands-resources (JD-R) model of burnout eighteen years ago (Demerouti et al. 2001), the JD-R theory has accumulated widespread interest amongst organisational practitioners, government agencies, and scholars alike (Bakker and Demerouti 2017). Essentially, the JD-R theory evinces the "leveraging of job-resources to mitigate job-demands" to enhance employee-wellbeing, and subsequently, effective organisational functioning (Bakker and Demerouti 2017, 282). Notably, the said theory continues to dominate engagement studies (Bailey et al. 2017).

In light of rampant burnout issues in Western countries, empirical studies on the burnout syndrome blossomed (Bakker, Demerouti, and Schaufeli 2002). Scholars attributed the cause to “(i) wrong expectations, (ii) progressive disillusionment, (iii) loss of coping resources, (iv) emotionally demanding interactions, and (v) lack of reciprocity in exchange relationships” (Bakker and Demerouti 2017, 273). Back then, a comprehensive theoretical framework capable of explaining burnout was lacking (Bakker and Demerouti 2017).

In the first decade since the inception of the JD-R model, scholars in the discipline placed strong emphasis on burnout (Bakker and Demerouti 2017). In Demerouti et al. (2001)’s pioneering study, the first proposition of the JD-R model was born. Working conditions were classified either as job demands and job resources. Job resources serve functional roles in goal-achievement, buffering of job demands, whilst stimulating personal growth, learning and development (Demerouti et al. 2001; Bakker and Demerouti 2007, 314; 2017, 274). Job demands, on the other hand, are job aspects which require sustenance in physical and psychological efforts (Bakker and Demerouti 2007, 312; 2017).

The second proposition of the theory suggested an association between job demands-resources and motivational processes (Demerouti et al. 2001). While job demands impede in-role performance (Bakker et al. 2003), job resources predict engagement, superior work performance, and encourage organisational commitment (Bakker, Demerouti, and Verbeke 2004; Hakanen, Schaufeli, and Ahola 2008).

The third proposition of the JD-R theory explored the interactions between job demands and resources (Bakker and Demerouti 2007,314). Job resources buffer strain imposed by job demands (Bakker, Demerouti, and Euwema 2005; Bakker and Demerouti 2007; Xanthopoulou et al. 2007; Bakker and Demerouti 2017). In other words, employees with more job resources are more capable of coping with job demands (Bakker and Demerouti 2017, 274). Subsequently, the conception of the Utrecht Work Engagement Scale (UWES) by Schaufeli and Bakker (2004) expanded the JD-R theory by offering new ways of investigating employees’ wellbeing (Bakker and Demerouti 2017, 274). In exact, conditions enabling employees to flourish at work were studied.

Further on, the fourth proposition of the theory stated that job resources exert large influence on motivation when facing pressing job demands (Xanthopoulou et al. 2007). Essentially, job resources, namely, skill variety, innovative capacity, and appreciation were found to predict engagement levels (Bakker and Demerouti 2017,275). Similarly, these resources encourage dedication, vigour, and absorption among employees in face of high job-demands (Bakker and Demerouti 2007, 315; Schaufeli and Bakker 2010; Bakker and Demerouti 2017, 275). Employees without sufficient job resources to buffer job strain will generate more job demands,

causing chronic exhaustion and burnout over time (Demerouti et al. 2009,65; Bakker and Costa 2014,117). However, Karasek (1979) suggested a noteworthy notion whereby a combination of high levels of both demands and resources exist in active jobs. Consequentially, employees in higher status occupations were found to have healthier mental states, but were also more affected by negative circumstances in their work (Karasek 1979).

In the fifth proposition, personal resources such as optimism and self-efficacy are found to exert similar roles as job resources (Xanthopoulou, Bakker, and Fischbach 2013; Bakker and Sanz-Vergel 2013) by serving motivational roles, buffer undesirable strain, and positively affect engagement levels. In face of challenging job demands, these personal resources determine the extent of control an individual believes he could exert over the environment (Bandura 1986). Nevertheless, empirical researches on the interaction between job demands and personal resources are scarcely available (Bakker and Demerouti 2017, 275). Albeit Xanthopoulou, Bakker, and Fishbach's (2013, 82) findings that optimism failed to predict work engagement regardless of the magnitude of job demands among employees of an electronics company in the Netherlands, Bakker and Sanz-Vergel (2013) proved that self-efficacy and optimism positively influence work engagement among healthcare nurses when job demands are high.

The sixth proposition suggested the positive impact of motivation on job performance (Bakker, Van Emmerik, and Van Riet 2008; Bakker and Demerouti 2017). Supported by the works of Hopstaken et al. (2016), engaged individuals are found to perform better at demanding tasks. Engaged employees are motivated, making them goal-oriented and task-focused individuals (Bakker and Demerouti 2017,275). To sum up propositions formed in the first decade, scholars have concluded that job resources instigate motivation, and exhibit similar properties as personal resources which extendedly affect work engagement (Xanthopoulou et al. 2009; Bakker and Demerouti 2017).

The seventh proposition of the JD-R theory posits is that highly motivated employees are likely to engage in job crafting behaviours (Bakker and Demerouti 2017). Such behaviour is largely desired due to its ability to develop an expanded set of job and personal resources, job satisfaction, enrichment, efficiency, performance, reduced strain, motivation, and engagement (Tims and Bakker 2010; Bakker, Tims, and Derks 2012; Adler and Koch 2017; Bakker and Demerouti 2017; Bruning and Campion 2018). The job crafting proposition is central to this study. The three characteristics of job crafting behaviour, namely, (i) self-targeted to benefit the individual pursuing job crafting, (ii) volitional, and (iii) results in significant changes in structural, task, or social domains of the work environment (Bruning and Campion 2018) relates to this study as (i) personal motivation is central to training transfer issues and therefore,

corresponds to the first two characteristics of job crafting, and (ii) a supportive psychological and social work environment that reinforces task performance is required to facilitate transformational efforts.

Two perspectives exist within the job crafting proposition (Lazazzara, Tims, and de Gennaro 2020), namely role or resource-based perspectives. The first, coined by Wrzesniewski and Dutton (2001), suggests job crafting behaviour as the alteration in structural, social, or cognitive domains of work to enhance work meaning. The second domain, which has been extensively adopted in JD-R research (Bakker and Demerouti 2017), defines job crafting behaviour as proactive alterations to job demands and resources beyond structural, task, or cognitive areas (Demerouti et al. 2001; Tims, Bakker, and Derks 2012; Bruning and Campion 2018,499). To clarify, cognitive resources, according to Bandura (2001), are mindful brain processes capable of influencing the environment to achieve desired outcomes.

Zhang and Parker (2018) and Lazazzara, Tims, and de Gennaro (2020) opined that inconsistencies between both perspectives on the role of cognition in job crafting have distorted theoretical understanding. In Bakker and Demerouti's (2017) review on the application of the JD-R theory, the authors expressed an inclination towards Bakker, Tims, and Derks's (2012) resource-view of job crafting behaviour. The resource-based view perceives cognition as merely passive adaptations to work without actual alterations to job resources (Tims and Bakker 2010; Bakker, Tims, and Derks 2012; Zhang and Parker 2018). Inconsistencies between both role and resource job crafting perspectives are among the reasons resulting in inadequacy of the JD-R theory in addressing “contextual factors, interpersonal reactions, and emotional responses that elicit demands and resources experienced by employees.”(Bailey et al. 2017, 37).

Despite acknowledging the importance of cognition in influencing motivation and affect within the JD-R theory (Bakker and Demerouti 2017), there remains a lack of understanding on whether cognitive resources will actually generate job resources. In simpler words, extant literature insufficiently caters to disciplinary understanding on the association between personal resources, which within the scope of this study, involves the role of cognition, and job resources (Bakker and Demerouti 2017; Grover et al. 2018).

Furthermore, a missing link between cognitive-based personal resources and its association to approach role crafting was identified (Bruning and Campion 2018; Zhang and Parker 2018; Lazazzara, Tims, and de Gennaro 2020). To clarify, approach role crafting refers to “effortful, motivated, and improvement oriented actions” that improves wellbeing of individuals and their work environment (Bruning and Campion 2018, 506). These empirical loopholes must be covered to enhance theoretical understanding on the interplay between personal and job

resources, and subsequently its influence on the approach role crafting- an umbrella term governing social expansion and work-role expansion (Trefalt 2013; Demerouti 2014; Bruning and Campion 2018; Zhang and Parker 2018).

2.1.2 Broaden-and-Build Theory

This study shall incorporate the Broaden-and-Build (B&B) theory to complement the JD-R theory in attempt to address the shortcoming of the JD-R theory in explaining microprocesses that elicits job resources experienced by employees (Bakker and Demerouti 2017; Bailey et al. 2017).

Generally, the B&B theory (Fredrickson 2004a) consists of two corollaries, namely, broaden and build. The broaden corollary suggests that positive emotions will “broaden an individual’s behavioural repertoire”, whilst build suggests that positive emotions would build durable skills and personal resources that facilitate coping. Examples of personal resources are such as intellectual, physical, social or psychological resources (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013).

The theory suggests that positive emotions are influential in an individual’s relationship of building efforts with others (Fredrickson 2004a; Cooper, Kong, and Crossley 2018). According to Vacharkulksemsuk and Fredrickson (2013), the broaden aspects of positive emotions are capable of altering an individual’s scope of attention and cognition. Therefore, positive emotions are influential in reducing differences between individuals, strengthens interpersonal relationships, and offers opportunities in promoting interdependence. Similarly, broadened cognition is capable of determining positive emotions (Garland, Gaylord, and Fredrickson 2011; Vacharkulksemsuk and Fredrickson 2013; Chen, Allen, and Hou 2020) and prosocial behaviour (Good et al. 2016).

However, empirical investigations hedging on the B&B theory in organisational settings remain at a nascent stage. Mediators to the relationship between positive emotions and workplace benefits, such as enhanced interpersonal relations, remain underexplored (Vacharkulksemsuk and Fredrickson 2013).

2.1.3 Kirkpatrick’s Training Evaluation Model

Training has long been perceived as an imperative for superior organisational performance due to its strong ability in nurturing talents’ knowledge and skills, quality and behaviour (Kraiger 2003). The benefits yielded from transfer of training lead to increased organisational competitiveness and value creation- which is why organisations are willing to invest huge

amounts of money in developing their human capital (Cowman and McCarthy 2017). Nevertheless, transfer of training remains a concern.

Developed in 1956, the Kirkpatrick Training Evaluation Model (KTEM) has since been widely used to assess the impacts of training on individuals and their organisations (Nik Nazli and Sheikh Khairudin 2018). According to Kirkpatrick (1994), the four levels of training evaluation are namely, (i) reaction, (ii) learning, (iii) behaviour, and (iv) organisational impact. Based on extant literature (Kirkpatrick 1994; Steensma and Groeneveld 2010; Aluko and Shonubi 2014; Nik Nazli and Sheikh Khairudin 2018), explanations on the four levels in KTEM are as follows. Reaction assesses trainee's first reception towards the training, whether they learnt from the training and serves as a basis of encouragement for future participation in training programmes. According to Kirkpatrick (1996), learning refers to the extent of change in attitude, increased knowledge and skills after participating in training programmes. Therefore, this level focuses on evaluating training effectiveness based on what trainees have learnt and retained. The third level- behaviour, assesses the extent of training outcomes transferred to the trainee's work and workplace. Congruent with the construct, 'transfer of training', the training shall fail to exert influence on organisational results if trainees refuse to apply outcomes to their work. Lastly, organisational impact measures the extent of organisational goal attainment through training and is normally measured monetarily or numerically (Reio et al. 2017). However, this study seeks to measure organisational impact through OCB, consistent with the works of Nik Nazli and Sheikh Khairudin (2018) and as suggested by Reio et al. (2017).

Choi, Lee, and Jacobs (2015) suggested that most training evaluations focus on the reaction and learning levels. This study, however, will emphasize on the behavioural and organisational impact stages, consistent with the work of Nik Nazli and Sheikh Khairudin (2018). According to existing literatures by Kirkpatrick (1996), Steensma and Groeneveld (2010, 320), and Nik Nazli and Khairudin (2018,123), the behavioural stage is significant because refusal from trainees to apply training outcomes to their work will deter organisational results, and subsequently, organisational goals. The KTEM model is seen as hierarchical in nature and each level are causally linked (Alliger and Janak 1989). Despite calls for a thorough examination on all four levels, scholars suggest that evaluating the first two levels are only necessary if no behavioural change has occurred (Bates 2004; Kirkpatrick and Kirkpatrick 2005; Reio et al. 2017).

Despite its wide utilisation in training evaluation due to its systematic and simple properties, the KTEM has its shortcomings in terms of considering individual factors that enhances training effectiveness (Bates 2004; Reio et al. 2017).

2.1.4 Integration of Theories and Relation to the Study

The integration of JD-R theory, B&B theory, and KTEM model are important to bridge the inadequacy of the JD-R theory in addressing “contextual factors, interpersonal reactions, and emotional responses that elicit demands and resources experienced by employees” (Bailey et al. 2017, 37), as well as the shortcomings of KTEM model in investigating individual factors that influence behavioural changes after training (Bates 2004; Reio et al. 2017).

Generally, by integrating these theories, this study seeks to examine the role of individual’s personal resources (represented by the cognitively dominant PsyCap) on resources (represented by TOT) through positive affect (represented by EE), and how the interplay between personal resources and job resources will subsequently result in work-role and social expansion (represented by OCB).

2.2 Operationalisation of Key Constructs in the Study

2.2.1 Psychological Capital (PsyCap)

The development of human capital is imperative in pursuit of competitive advantage. According to Luthans, Youssef, and Avolio (2007, 550), PsyCap represents an individual’s motivated efforts and resilience to positively appraise circumstances and increase likelihood of success. PsyCap is characterized by the following: (i) self-efficacy, (ii) optimism, (iii) hope, and (iv) resilience (Luthans, Youssef, and Avolio 2007, 542; Grover et al. 2018, 969; Nolzen 2018, 271) . A combination of the four mentioned resources forms a higher-order construct which demonstrates the superiority in the psychological capacities of human (Luthans and Youssef 2004; Avey et al. 2011). The specifications of PsyCap as a higher-order construct have been empirically supported, indicating that removal of any of the lower order constructs, namely, hope, resilience, optimism, and efficacy, will alter the meaning of PsyCap (Luthans et al. 2007; Luthans and Youssef-Morgan 2017).

According to Nolzen (2018) and Luthans and Youssef-Morgan (2017), all four dimensions of PsyCap are state-like traits which can be developed. Additionally, PsyCap is perceived as malleable individual adaptability towards the environment (Costantini et al. 2017), and unrestricted to work roles. Moreover, PsyCap has been associated with future time perspective which refers to an individual’s plan, perception of their future needs, as well as the connection between present activities and future goals (Abubakar, Foroutan, and Megdadi 2019). According to Rudolph et al. (2018), personal resources are significant predictors of future time perspective. Abubakar, Foroutan, and Megdadi (2019) suggested that individuals fueled with PsyCap are motivated and persistent in future goal accomplishment, thus, extends beyond

work contexts and time (Roche, Haar, and Luthans 2014). Besides, it is noteworthy that PsyCap facilitates cognitive appraisal, as well as broadening and building effect on positive emotions (Luthans and Youssef-Morgan 2017).

Based on Bandura's (1986) theory on self-efficacy, an efficacious individual possesses strong locus of control. In other words, an efficacious individual is capable of deploying cognitive resources to remain motivated, even in the most challenging situations (Maurer and Pierce 1998). Self-efficacy has been widely associated with job satisfaction (Islam and Ahmed 2018), emotional stability (Alessandri et al. 2018), motivation (van den Heuvel, Demerouti, and Peeters 2015), career adaptability (Hirschi, Herrmann, and Keller 2015), leadership (Cooper, Kong, and Crossley 2018), workplace performance (Stajkovic and Luthans 1998), as well as training reaction (Bhatti and Kaur 2010). Optimism, on the other hand, stems from an individual's perception of his current or future success (Scheier and Carver 1985; Abubakar, Foroutan, and Megdadi 2019). In other words, optimistic individuals possess high locus of control (Luthans and Youssef-Morgan 2017). Under work environments, this state-like construct is found to predict leadership effectiveness, workplace performance, and career adaptability (Nolzen 2018).

Hope represents a positive motivational state that instills perseverance and determination in an individual which leads to, or, redirects the path to achieving set goals (Snyder et al. 1996; Luthans and Youssef-Morgan 2017). A hopeful individual is said to be largely motivated by his confidence in navigating towards a set of goals (Nolzen 2018). Resilience refers to an individual's ability to sustain, retaliate, and persevere in facing setbacks and adversity to achieve desired success through positive adaptation processes (Luthans et al. 2007; Avey et al. 2011; Luthans and Youssef-Morgan 2017). According to Masten et al. (2009), resilience evinces the leveraging personal, psychological, and personal assets to overcome adversities.

Previous studies suggested the direct influence of PsyCap on the psychological wellbeing and desirable attitudes among employees (Norman et al. 2010; Luthans et al. 2010). The construct apprehends the motivation and emotional capacity of individuals which affects how employees deal with job demands-resources at work (Grover et al. 2018, 969). PsyCap is perceived as a personal resource, of which, according to the fifth proposition of the JD-R theory, exhibits similar functions as job-resources (Bakker and Demerouti 2017; Nolzen 2018; Grover et al. 2018). In the job crafting domain, individuals are seen as crafters of their own work (Wrzesniewski and Dutton 2001a) which implicates that metacognition abilities of an individual results in an increase in job resources (Bruning and Campion 2018). Numerous past studies have reported PsyCap as an antecedent of positive behaviour, attitude, and work-related outcomes (e.g. Luthans et al. 2007; Norman et al. 2010; Avey et al. 2011; Pouramini

and Fayyazi 2015) which is central to the interest of this study in such a way that PsyCap, as a personal resource which carries cognitive and motivational traits, may positively influence TOT.

2.2.2 Employee Engagement (EE)

Since the introduction of personal engagement by Kahn (1990), the construct broadened into four main streams, namely personal role engagement, multidimensional engagement, engagement as a management practice, and work engagement, which is the perspective adopted in this study.

Personal role engagement is understood as an individual's emotional, physical, and cognitive expression of one's self in terms of effort, job involvement, flow, mindfulness, and intrinsic motivation when performing work (Kahn 1990). Kahn's personal engagement inspired the works of May, Gilson, and Harter (2004), Rich, Lepine, and Crawford (2010), and Soane et al. (2012). According to May, Gilson, and Harter (2004), individuals who find their work fulfilling are those who are able to immerse themselves in work. Sharing Kahn's (1990) operationalisation, May, Gilson, and Harter saw job involvement (Brown 1996) and flow as essential elements of engagement (Csikszentmihalyi 1975; 1990). Job involvement signifies the extent to which a job satisfies an individual's psychological identification (Lawler and Hall 1970, 310; Csikszentmihalyi 1975; Kanungo 1982, 342; Brown 1996). Flow, on the other hand, refers to a state where an individual blends into the work environment and pursues work relentlessly (Csikszentmihalyi 1975, 36; 1990). However, Kahn (1990) suggested that engagement is primarily cognitive-driven, and the extent of absorption hedges on the magnitude of absorption.

In the next decade, the most popular perspective on engagement was conceived. Defined as a positive, fulfilling, and mindful state of motivation focused on work, EE, or better known as work engagement (Schaufeli et al. 2019; Hakanen et al. 2019) is characterised by (i) vigour which is the extent where employees find themselves bursting with energy, (ii) dedication which represents their enthusiasm towards work content and actions, and (iii) absorption which is the state where time seems to pass quickly as employees are immersed in their work (Schaufeli et al. 2002, 74; Schaufeli and Bakker 2010, 13; Bakker and Demerouti 2017, 275). This Utrecht perspective of engagement has dominated engagement-related studies (Bailey et al. 2017). In other words, engagement in this perspective signifies employees' willingness to devote time or effort in pursuing goals, while fully committing themselves to work (Schaufeli et al. 2002; Schaufeli and Bakker 2010; Bakker and Demerouti 2017). The Utrecht perspective of work engagement was built on the premise of personal engagement, with traces of

similarities between absorption and flow, and dedication with vigour as well as dedication. However, there are clear distinctions between mentioned perspectives. Work engagement is seen as a relatively stable and enduring psychological state (Schaufeli et al. 2002), as compared to personal engagement which is prone to fluctuations between the extremes of engagement and disengagement (Kahn 1990). However, EE is bestowed by an employee in response to experienced and perceived benefits from the immediate environment (Sweetman and Luthans 2010; Bailey et al. 2017) and are heavily reliant on exchange relationships (Krauss et al. 2020).

Further on, Saks (2006; 2019) segregated work engagement from organisational commitment based on two reasons. First, work engagement, unlike organisational commitment, is not a form of attitude nor sense of attachment, but rather the attentiveness and absorption involved in performing work. Additionally, work engagement focuses on formal roles whilst organisational commitment and organisational citizenship behaviour are voluntary extra-role behaviour. Drawing on the various benefits that engagement has to offer, human resource management (HRM) practitioners proposed engagement as a management practice (Bailey et al. 2017). In other words, HRM practitioners suggested that engagement can be developed or demanded (Jenkins and Delbridge 2013; Arrowsmith and Parker 2013). Nevertheless, to date, advances of EE in the HRM field remain weak (Bailey et al. 2017).

Bailey et al. (2017), in a systematic review, identified five predicting groups of EE, namely, leadership, organisational and team factors, organisational interventions, job design, as well as psychological states. Meanwhile, its outcomes are positively linked to high individual morale, task performance, organisational performance, and extra-role performance.

Given the measurability of Utrecht's perspective on EE, further supported by its wide adoption in social sciences studies, universality, and having its theoretical foundations anchored against the JD-R theory (Bailey et al. 2017), this study operationalises EE based on Schaufeli et al.'s (2002) definition. Noteworthy, EE is confined within work systems, thus, suggesting a higher level of passion at work as well as dedication towards organisational goals among highly engaged employees (Bal, Kooij, and De Jong 2013; Aktar and Pangil 2018).

2.2.3 Transfer of Training (TOT)

Consistent to the third level of the Kirkpatrick's Training Evaluation Model (Kirkpatrick 1994), TOT is traditionally defined as (i) the extent of applying training outcomes constituting of knowledge, skills, and attitude to work contexts, and (ii) sustaining them over time (Baldwin and Ford 1988). Nevertheless, recently, scholars are inclined towards viewing transfer as a chain of choices made by trainees in "discarding, maintaining, applying, or modifying" work elements (Baldwin, Ford, and Blume 2017). In the same vein, literature responses from

Aragón, Jiménez Jiménez, and Sanz Valle (2014) and Kalmuk and Acar (2015) suggested that training effectiveness hedges on participants' willingness to alter their behaviour to gain new knowledge and insights when performing work- therefore, suggesting that unless training outcomes have been successfully applied to work setting, the training offers minimal effectiveness. Organisations are primarily concerned towards TOT as it is perceived as mechanism for enhanced job performance (Chiaburu and Tekleab 2005; Bouzguenda 2014; Botke et al. 2018) and subsequently, promotes value addition to an organisation's key resources (Khan, Mufti, and Nazir 2015). Based on the definition of TOT, the construct is perceived as a job resource in this study. To recapitulate, the JD-R theory perceives job resources as job aspects that facilitate goal attainment and steer personal development.

In view of the fourth industrial revolution, digital competency plays an indispensable role in preventing an individual's economic relevancy from becoming obsolete (Gontkovičová, Mihaľčová, and Pružinský 2015), thereby, exhibiting potential to mitigate economic stressors while leveraging work talent's adaptability towards environmental synergies (Forrier, Verbruggen, and De Cuyper 2015; Akkermans and Tims 2017). Existing literature defined digital competency as the continuous adoption of ICTs (strategic attitude) to capture advanced skills and knowledge encompassing intercultural, creative, critical, and autonomous dimensions (Ala-Mutka 2011; Vieru 2015; Colbert, Yee, and George 2016; Murawski and Bick 2017; Alam et al. 2018).

A survey conducted by The Economist Corporate Network (2017) found that soft skills (32.6% importance level) and people skills (36.0%) are increasingly crucial for a digital climate; whilst technical skills, hard skills, business skills and others weigh relatively smaller portions at 9.0%, 5.6%, 14.6% and 2.2% respectively. These competencies include process understanding, ability to operate digital technologies, being aware of cybersecurity, creativity, complex problem-solving ability, analytical skills, efficiency orientation, cultural awareness, ability to communicate effectively, meaningful participation, ambiguity tolerance and a sustainable mindset (Hecklau et al. 2016; Andriole 2018).

Nevertheless, the definition of 'digital competency' in practical terms remains vague and lacks specificity in work-industry contexts (Janssen et al. 2013; Murawski and Bick 2017). This study seeks to contribute by defining the constituents of digital competencies based on four dimensions, namely, technical, methodological, social, and personal competencies, subsequently, incorporating them in the TOT construct and testing them empirically. The application of digital competencies at the workplace is seen as exhibition of TOT for two reasons, namely, (i) human resource practitioners and policy makers lauded training as an essential tool to develop digital competencies (Hecklau et al. 2016) and (ii) without actual

application of digital competencies at the workplace, no transfer has been made in accordance to the definition of TOT (Baldwin, Ford, and Blume 2017). In other words, training and the development of digital competencies are intricately linked. Therefore, the effectiveness of training in developing digital competencies should be rested on TOT. Furthermore, scholars have emphasized on the importance of contextualised knowledge, skills, and attitude as a measure of TOT, where failure to incorporate is an indication of fruitless literature advancement (Cheng and Hampson 2008; Cheng, Sanders, and Hampson 2015).

The first dimension of TOT is characterised by technical competency. According to Hecklau et al. (2016,2), technical competency refers to job-related knowledge and skills. In this regard, literature suggests that initial stages in becoming a digitally competent individual hinges on digital adoption (Colbert, Yee, and George 2016; Alam et al. 2018; Armstrong et al. 2018). Alam et al. (2018) suggested that digital adoption commences when an individual discovers the value in incorporating technological innovations into their activities. Besides, knowledge on ethical issues associated with the use of digital technologies and data, as well as the awareness of security measures are fundamental competences which the workforce should embrace in face of Industrial Revolution 4.0 (Hecklau et al. 2016; United Nations Economic and Social Council 2018). The susceptibility of digital contents to potential attacks over various points of the information network calls for cybersecurity practice (Dufva and Dufva 2019).

Methodological competency refers to problem-solving and decision-making abilities and skills (Hecklau 2016, 2). Digital fluency refers to an individual's ability in leveraging digital technologies to manipulate information, construct ideas, and achieve strategic goals (Hsi 2007; Colbert, Yee, and George 2016). Colbert, Yee, and George (2016, 732) shared Briggs and Makice's (2012) view on digital fluency as one of the most important aspects that forms "competencies of the digital workforce". Philbeck (2017, 90), the United Nations Economic and Social Council (2018) and Caruso (2018, 380) asserted the superiority of human cognitive ability in areas of creativity, critical thinking, and judgement are vital requisites of the digital workforce.

Social competencies, on the other hand, refers to the attitude, skills, and capacity to collaborate and communicate with others in digital environments (Hecklau 2016,2). Interpersonal relations, collaboration, and identity development are deemed as essential components of digital competency (Colbert, Yee, and George 2016; Dufva and Dufva 2019) alongside social intelligence and virtual collaboration (United Nations Economic and Social Council 2018; Hecklau et al. 2016).

The last component of digital competency, termed personal competencies, represent an individual's motivation, attitude and social values (Hecklau 2016,2). In a similar vein, Colbert, Yee, and George (2016), Alam et al. (2018), and Armstrong et al. (2018) posited that a digitally competent individual should possess lasting inclination and thought to lead a digitally enabled life while embracing digital transformations. Besides, knowledge on ethical issues associated with the use of digital technologies and data is seen as an imperative element in the digital age (Dufva and Dufva 2019). In a similar manner which the TOT construct is understood, the initial adoption of digital skills, knowledge, or attitude will progress into digital orientation, where an individual continuously adapts to the rapidly evolving requirements of a digital workforce. Furthermore, the rapidly evolving nature of digital technologies calls an open mindset towards development in the digital environment (Hecklau et al. 2016; United Nations Economic and Social Council 2018).

2.2.4 Organisational Citizenship Behaviour (OCB)

The notion of “citizenship behaviour” was introduced by Bateman and Organ (1983) as extra-role gestures that are not prescribed within the formal job scope yet facilitate the social machinery in an organisation. In its earliest form, two characteristics of citizenship behaviour were identified, namely: (i) altruism- a helping behaviour directed at other individuals and (ii) generalised compliance- a “good soldier” syndrome that prioritises benefits for the system which an individual exists in through proper actions (Smith, Organ, and Near 1983). A third form of citizenship contribution was identified as civic virtue, which refers to accountable participation in organisational aspects (Graham 1986). Since then, scholarly consensus has been established that OCB results in favourable behaviour, attitude, intention, and positive organisational outcomes (Carpenter, Berry, and Houston 2014; Podsakoff et al. 2009; Memon et al. 2017; Shareef and Atan 2019) that are beneficial to organisational functioning.

In 1988, Organ (1988, 4) defined Organisational Citizenship Behaviour (OCB) as an “individual behaviour that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization” encompassing dimensions of (i) civic virtue which represents an employees' commitment to participate in an organisation's political aspects, (ii) altruism which constitutes willingness to helping others with relevant tasks or problems, (iii) conscientiousness which refers to employees' willingness to perform boundaryless tasks, (iv) sportsmanship where one refrains from cynicism and exhibit positivity, and (v) courtesy which refers to the employee's proactiveness in preventing problems whilst forwarding goals and objectives.

Subsequent scholarship in the field of OCB were built on Organ's (1988) five dimensions (Ocampo et al. 2018), including the notable two-dimensional operationalisation of OCB

introduced by Williams and Anderson (1991). Williams and Anderson (1991) opined that Organ's five-dimensional OCB can be reduced to two dimensions, namely, individual-directed OCB (OCB-I) and organisation-directed OCB (OCB-O) where the former comprises of altruism and courtesy while the latter is characterised by conscientiousness, civic virtue, and sportsmanship.

Various researches suggest that OCB is better captured when operationalised as OCB-I and OCB-O as it consolidates most of the OCB-related constructs within its domains (Williams and Anderson 1991; Lee and Allen 2002; Chiaburu and Baker 2006; Saks 2006; Podsakoff et al. 2009; Cheung 2013; Shareef and Atan 2019; Saks 2019). According to Podsakoff et al. (2009), OCB-I reflects additional dimensions of interpersonal helping (Graham 1989), peacekeeping and cheerleading (Organ 1990; Ocampo et al. 2018), as well as interpersonal facilitation (Van Scotter and Motowidlo 1996). Similarly, OCB-O accommodates organisational loyalty (Graham 1991), job dedication (Van Scotter and Motowidlo 1996), endorsement of organisational objectives (Borman and Motowidlo 1997), voice behaviour that provides constructive feedback for improvements (Van Dyne and Lepine 1998), proactiveness in taking charge (Morrison and Phelps 1999), as well as being concerned towards organisational image (Farh, Zhong, and Organ 2004). Hence, Williams and Anderson's (1991) categorisation of OCB is vastly adopted, including studies in Malaysian settings (e.g. Memon et al. 2017b; Abdullah, Marican, and Mohd Kamil 2019). It is also noteworthy that Organ has expressed favour towards Williams and Anderson's conceptualisation of OCB (Organ 1997).

Over the years, OCB has been widely associated with various terminologies due to overlapping of behavioural domains. The terminologies associated with OCB include (i) prosocial behaviour- actions that produces, maintains, and preserves the wellbeing of other collective members (Brief and Motowidlo 1986, 710), (ii) extra role behaviour which refers to positive behaviours which are non-prescribed, unrecognised within formal reward systems and non-punitive in nature, yet important in dynamic work environments (Van Dyne et al. 1995; Van Dyne and Lepine 1998); (iii) organisational spontaneity that evinces performing extra-role behaviour by assisting co-workers, defending the organisation, giving constructive ideas, engage in self-development, and giving cooperation (George and Jones 1997), and (iv) contextual performance that supports the social and psychological context to complement the core activities in an organisation (Motowidlo and Van Scotter 1994; Van Scotter and Motowidlo 1996; Borman and Motowidlo 1997). Despite the variance in its terms and definition, the mentioned terminologies share a common theme that highlights the importance of behaviours that support collective members and enhance the work environment. According to Lepine, Erez, and Johnson (2002), contextual performance is the most significant element that constitutes OCB. Therefore, in 1997, Organ redefined OCB as "behaviour that maintains

and enhances the psychological and social context that reinforces task performance” (Organ 1997, 91).

In recent years, individuals are increasingly seen as crafters of their own work. In other words, individuals are capable of influencing the resources and demands experienced at work (Bakker and Demerouti 2017). One of the elements of job crafting is approach role crafting (Zhang and Parker 2018; Bruning and Campion 2018; Lazazzara, Tims, and de Gennaro 2020)- an aggregate construct that hosts the central theme of OCB, which is “to maintain and enhance the psychological and social context that reinforces task performance”. According to Lazazzara, Tims, and de Gennaro (2020), approach role crafting consists of work-role expansion and social expansion which is defined as “self-initiated expansion of an individual’s work role to include work elements that were not included in formal job descriptions” and “the allocation and contribution of resources to another collective member” respectively (Bruning and Campion 2018, 507). Giving the overlapping nature in behaviour, this study equates the aggregate form of OCB as a display of approach role crafting.

2.3 A Review on the Relationship between Key Constructs

2.3.1 PsyCap and EE

The first hypothesis of this study involves the role of PsyCap as a personal resource (Grover et al. 2018; Kotzé 2018). The second proposition of the JD-R theory postulates that job resources instigates engagement, while the fifth proposition of the JD-R theory posited that personal resources exert similar effects as those of job resources in predicting engagement (Demerouti et al. 2001; Hakanen, Schaufeli, and Ahola 2008; Bakker and Demerouti 2017). In other words, personal resources directly affect engagement. Past studies reported the positive influence of job resources on engagement, with the intervention of personal resources (Kahn 1990; May, Gilson, and Harter 2004; Albrecht et al. 2015).

Kahn (1990) and May et al. (2004), in their respective empirical studies, suggested that personal-resources (*psychological availability, safety, and meaningfulness*) influences engagement. In a similar vein, Barreiro and Treglown (2020) associated positive psychological resources such as self-motivation with high levels of engagement. In fact, the relationship between PsyCap and engagement has been explored in previous literature.

For instance, Siu, Bakker, and Jiang (2014) validated the positive relationship between PsyCap and engagement among university students mediated by intrinsic motivation. Congruently, Pouramini and Fayyazi (2015) suggested that high PsyCap strongly and positively predicts EE. Similarly, Grover et al. (2018) similarly found that PsyCap affects nurses’ perceptions of job demands and directly increase engagement levels. Tisu et al. (2020) further substantiated the

relationship in Romanian workers. However, De Waal and Pienaar (2013) found contrasting evidence for the PsyCap-engagement relationship. In Waal and Pienaar's (2013) study on workers in a chemical factory, PsyCap failed to predict engagement. Although extensively studied, empirical evidence supporting the relationship varies. Nevertheless, PsyCap plays a significant role in elevating performance via work engagement channels (Alessandri et al. 2018), and a high internalized sense of control is likely to influence higher work engagement levels (Tims, Bakker, and Derks 2012; Barreiro and Treglown 2020). In a local context, the relationship between components of PsyCap and EE has been validated in the works of Othman and Mohd Nasurdin (2011) where the authors found positive relationships between hope and work engagement ; as well as resilience and engagement among healthcare workers serving in public hospitals.

Therefore, Banihani, Lewis, and Syed (2013) and Bailey et al. (2017) called for an investigation on engagement from various demographic backgrounds. Additionally, Bailey et al. (2017) asserted that less attention has been paid to study settings, particularly where industry sectors and job nature are concerned. Therefore, this study proposes to confirm the following hypothesis in the context of youth participants of Industrial Revolution 4.0 in Sarawak:

H1: Psychological capital positively influences employee engagement.

2.3.2 EE and TOT

Studies suggested that training- a key HRM practice (Albrecht et al. 2015) is crucial for personal development (Huselid 1995; Zheng and Lamond 2010) and for calibration of skills and knowledge (International Labour Organisation 2019; Gontkovičová, Mihalčová, and Pružinský 2015). From a theoretical perspective, the KTEM model has been criticized for its insufficiency at considering contextual or individual factors that influence training effectiveness (Bates 2004). Consistently, Baldwin, Ford, and Blume (2017), TOT, which is the ultimate measure of training effectiveness remains a practical issue.

Meanwhile, Cheng and Ho (2001), in agreement with Baldwin and Ford (1988) outlined trainee characteristics, workgroup support, training design, and work environment as determinants of TOT. Works by Khan, Mufti, and Nazir (2015) and Blume et al. (2019) specifically highlighted the need to build on psychological state, emotional factors and the respective effects on TOT. As mentioned in earlier sections, transfer failures were largely attributed to personal motivations (Elliott, Dawson, and Edwards 2009). Given the specification of EE as a positive, fulfilling, and mindful state of motivation focused on work (Schaufeli et al. 2019; Hakanen et al. 2019), this study seeks to examine the influence of

motivation on TOT through the construct of EE. Furthermore, Bailey et al. (2017) suggested that extant literature on engagement holds minimal practicality for managerial practitioners due to its weak establishment in human resource management (HRM) disciplines.

A compatibility between the new notion of TOT which evinces the maintenance, application, and modification of work elements and the job crafting proposition in the JD-R theory was found. Resources, according to the first proposition of the JD-R theory, refers to “(i) physical, (ii) psychological, (iii) social, or (iv) organisational aspects” that play functional roles in goal-achievement, buffering of job-demands, whilst stimulating “personal growth, learning and development” (Bakker and Demerouti 2007,314; Bakker 2011; Bakker and Demerouti 2017,274). From this perspective, this study operationalizes TOT as a job resource since the actual application of knowledge, attitude, and skills to the workplace would mitigate demands experienced by employees under a dynamic working environment.

The job crafting proposition suggests that motivated employees are likely to attain more job resources through proactive task alteration (Bakker and Demerouti 2017). Therefore, the JD-R theory was incorporated to complement the KTEM model in attempt to explain how motivational factors would affect TOT. As the JD-R theory and KTEM model falls short in addressing contextual and emotional influences on resources experienced by employees, the B&B theory was incorporated to support the proposed positive relationship between EE and TOT. The B&B theory manifests that positive emotions elicit alteration in human behaviour, and further translates into acquirement of sustainable resources (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013).

Past studies suggested that employees who are engaged in their work may be more willing to transfer their learning outcomes to the workplace (Salanova, Agut, and Peiró 2005; Pugh and Bergin 2006; Khan, Mufti, and Nazir 2015). However, their line of reasoning does not provide empirical evidence on the direct relationship between engagement and TOT. Extant empirical evidence was substantiated in Nik Nazli and Sheikh Khairudin (2018)’s study who found EE to significantly and positively influence TOT in the Malaysian civil defence force. However, the empirical support justifying the direct link between engagement and TOT remains scarce (Pugh and Bergin 2006; Nik Nazli and Sheikh Khairudin 2018).

Understanding the role of EE in determining TOT among youth participants of Industrial Revolution 4.0 in Sarawak is pivotal as Malaysian workers are highly disengaged from work (Gallup Inc. 2017). Additionally, youth workers are denounced for their leisurely attitude towards work (Ooi et al. 2017). Moreover, disengagement issues may influence the ability of youth to attain resources. Nevertheless, engaged individuals generally do not draw boundaries in allocation of physical, emotional, or cognitive energies at work (Schaufeli et al. 2002;

Schaufeli and Bakker 2010; Rich, Lepine, and Crawford 2010; Bakker and Demerouti 2017). This study is targeted at youth participants of Industrial Revolution 4.0 in Sarawak whom have undertaken related trainings. To reiterate, transfer of training is operationalised as a job resource that instigates engagement (Bakker and Demerouti 2017). Following this line of reasoning, this study posits that engaged employees could be more willing to apply acquired digital competencies at work.

Thus, the following hypothesis is formulated.

H2: Employee engagement positively influences transfer of training.

2.3.3 PsyCap and TOT

Sharing similar grounds that proposes EE as a predictor of TOT, this study seeks to examine the influence of motivation on TOT through PsyCap- a personal resource that demonstrates an individual's motivated efforts and resilience to positively appraise circumstances and increase the likelihood of success (Luthans, Youssef, and Avolio 2007; Luthans and Youssef-Morgan 2017). Luthans et al. (2010) suggested that PsyCap resources are state-like constructs which are relatively flexible than personality traits, yet comparatively stable against moods and emotions. Similarly, PsyCap is suggested to trigger positive affect, thereby, promotes job resources (Nolzen 2018). Despite its motivational traits, PsyCap is unconfined within work domains and extends beyond time and context (Luthans and Youssef-Morgan 2017).

Extant literature on the role of PsyCap in training practices have mainly focused on pre-training PsyCap intervention, training motivation, or job performance (Baldwin, Ford, and Blume 2017). According to Colquitt, LePine, and Noe (2000) and Tabassi and Abu Bakar (2009), training motivation refers to characteristics of a willing individual to disburse efforts- characterised by "direction, intensity, and persistence" towards training reaction, learning, and behavioural stages. Luthans et al. (2010) in their Psychological Capital Intervention (PCI) study, posited that PsyCap, which can be developed- leads to elevated performance. In a similar vein, Combs, Luthans, and Griffith (2009) found that pre-training PsyCap development mediates the relationship between training motivation and transfer motivation. A positive association between PsyCap and job performance was found in extant literature (e.g.: Luthans et al. 2008; Abbas et al. 2014).

Combs, Luthans, and Griffith (2009) suggested that PsyCap may facilitate TOT. Weissbein et al. (2011) and Luthans and Youssef-Morgan (2017) concurrently suggested that PsyCap interventions are predictive of training transfer. However, there remains a dearth in empirical support for the said relationship. Notwithstanding the above, strands of empirical evidence for the role of self-efficacy, an individual component of PsyCap, on TOT are available.

Researchers found self-efficacy is capable of positively increasing training transfer (Chiaburu and Tekleab 2005; Gaudine and Saks 2004; Bhatti and Kaur 2010; Bouzguenda 2014; Chelliah et al. 2016). Bouzguenda (2014) claimed that employees tend to rely on peers to handle uncertainties at work despite training efforts. Another dimension of PsyCap- hope, was found to positively influence training motivation and subsequently, influence training transfer (Wenzel 2014). These relationships implicitly reaffirm the probable positive effects of PsyCap in reinforcing TOT.

The youth lack resources, such as, competence, identity, income, or networks required to optimize performance in dynamic work environments (Demerouti, Peeters, and van der Heijden 2012; Upadyaya and Salmela-Aro 2017; Salmela-Aro and Upadyaya 2018). Particularly, Malaysian youth are further disadvantaged by inexperience, labour market information asymmetry, and inability to communicate effectively to employers (Mohd Ibrahim and Mahyuddin 2016). Therefore, their economic relevancy has become questionable. In Malaysia where youth unemployment remains rampant (World Bank Group 2018), psychological disillusionment, anxiety, stress, and ultimately, withdrawal from economic participation ought to receive attention (Institute for Labour Market Information and Analysis 2019; Hällsten, Edling, and Rydgren 2017; Kovacs 2018).

Despite the lack of resources that enables the youth to tackle job demands in highly challenging economies, personal resources are said to exhibit similar properties as job resources to encourage development (Bakker and Demerouti 2017). However, in theory, the connection between personal resources (represented by PsyCap) and job resources (represented by TOT) has remained ambiguous (Bakker and Demerouti 2017; Bruning and Campion 2018; Grover et al. 2018). It is again reiterated that the B&B theory shall complement the missing psychological processes within the JD-R domain (Bailey et al. 2017). The B&B theory suggests that positive emotions are capable of strengthening one's (i) intellectual, (ii) physical, (iii) social, and (iv) combined psychological resources (Frederickson 2004). Based on Luthans et al.'s (2010) study, core constructs of PsyCap will induce extra efforts from individuals and lead to high performance. Additionally, Volmer and Wolff (2018) suggested that growth and performance is prevalent among employees who possess positive nature and strength. Furthermore, resourceful individuals are capable of generating more resources to buffer against job demands (Lee and Eissenstat 2018) Therefore, from a theoretical perspective, employees with PsyCap, which is a personal resource capable of prompting positive affect, may proactively alter task or relational boundaries within their work to generate more job resources.

Thus, the hypothesis regarding the nature of such relationship is suggested.

H3: Psychological capital positively influences transfer of training.

2.3.4 Role of EE as a Mediator in the Relationship between PsyCap and TOT

According to Schneider et al. (2018, 469), “a mediation effect potentially exists if antecedent-mediator and mediator-outcome relationships are significant”. Although empirical evidence on the relationships between PsyCap and TOT remains scarce (Combs, Luthans, and Griffith 2009), the relationship between PsyCap and EE has been relatively established (e.g. (Siu, Bakker, and Jiang 2014; Grover et al. 2018)). By examining the mediating role of EE on the relationship between PsyCap and TOT, insights on the currently ambiguous interaction between personal resources and job resources (Grover et al. 2018) can be found. Additionally, the proposed mediating effects of EE may enlighten the currently ambiguous theoretical understanding on the influence of emotional responses on job resources experienced by employees (Bailey et al. 2017, 37; Bakker and Demerouti 2017). Besides, the introduction of EE as a mediator to the relationship between PsyCap and TOT corresponds to Baldwin, Ford, and Blume's (2017) calling for studies on how TOT may be optimised. .

EE has exhibited potential mediator properties in extant literature (e.g. Collini, Guidroz, and Perez 2015; Abdelhadi, Drach-Zahavy; Schneider et al. 2018). This is attributed to the potential impact of EE on performance (Yalabik et al. 2013). EE has similarly demonstrated mediating properties in a Malaysian context concerning career development among Generation Y employees (Ooi et al. 2017). From a theoretical perspective, the B&B theory suggests that positive emotions are capable of leveraging resources owned by employees (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013). Past studies by Xanthopoulou et al. (2012) and Volmer and Wolff (2018) revealed that positive affect influences career-related evaluations and builds personal resources. Given the synonymity between personal resources and job resources (Bakker and Demerouti 2017), this study suggests that the presence of positive emotions will strengthen the association between personal resources and job resources, represented by PsyCap and TOT respectively.

As such, H4 is proposed.

H4: Employee engagement mediates the relationship between psychological capital and transfer of training.

2.3.5 EE and OCB

OCB, an essential behaviour that contributes to enhanced organisational functioning (Carpenter, Berry, and Houston 2014; Podsakoff et al. 2014; Memon et al. 2017a) is adopted as the measure of organisational impact in this study. Studies by Podsakoff, Ahearne, and

MacKenzie (1997) and Nielsen, Hrivnak, and Shaw (2009) provided evidence that OCBs results in positive work-group performance. In a 2009 meta-analysis examination on the relationships between OCB, individual, and organisational level outcomes, employees are found to experience reduced withdrawal symptoms alongside increased performance under the presence of OCB (Podsakoff et al. 2009).

An individual's capacity to initiate an expansion in his work elements beyond formal job descriptions and the allocation of resources to fellow collective members as an approach role-crafting behaviour (Bruning and Campion 2018; Lazazzara, Tims, and de Gennaro 2020) overlaps with the central theme of OCB whereby a good citizen would reinforce task performance by maintaining or enhance psychological and social context at work (Organ 1997). Additionally, OCB was seen as a source of sustainable social capital in organisations that leads to competitive advantage (Bolino, Turnley, and Bloodgood 2002). This further reinforces the choice of OCB as the measurement of organisational impact in this study.

While knowledge, skills, and attitudes are crucial determinants of task performance, dispositional factors, such as the affective state predicts OCB (Borman and Motowidlo 1997; Organ and Ryan 1995). Salas-Vallina, Alegre, and Fernandez (2017) in their study conducted on Spanish medical staffs suggested that happiness at work and organisational learning capabilities drive OCB. Results of Salas-Vallina, Alegre, and Fernandez's study showed that the study samples were generally unhappy and believe they lack progress-support due to deprivation of desired learning opportunities (Salas-Vallina, Alegre, and Fernandez 2017,482), thus suggesting a positive association between dispositional factors and OCB. In a similar vein, EE has been found to positively influence OCB in cross sectional studies (e.g. Rich, Lepine, and Crawford 2010; Madan and Srivastava 2017). Furthermore, Saks (2006; 2019), Finkelstein (2011), as well as Cheung, Peng, and Wong (2014) have also found a positive relationship between EE and OCB. This is due to the fact that engaged individuals generally do not draw boundaries in allocation of physical, emotional, or cognitive energies at work (Schaufeli et al. 2002; Schaufeli and Bakker 2010; Rich, Lepine, and Crawford 2010; Bakker and Demerouti 2017). In a local context, Ahmad and Omar (2015) suggested a positive relationship between EE and OCB; but has yet to validate the said relationship. As suggested by Ayob and Mat Nor (2019), engagement related studies and their organisational-related outcomes are understudied in Malaysia; therefore, provides room for scrutiny on the said relationship.

Managerial negligence on training and development results in disengagement during transitional efforts, therefore, jeopardising employment relationships (Albrecht et al. 2015; Gallup Inc. 2017). Furthermore, youth are less inclined towards engaging in OCB (O'Driscoll and Roche 2017). According to Krauss et al. (2020), engagement among Malaysian youth is

highly dependent on sense of belongingness in their organisations, fulfilment of their needs for development, empowerment in decision making, and the capacity to contract with peers and adults. However, little is known of the association between EE and OCB among Malaysian youth. To be exact, the relationship between EE and OCB among the young workforce characterised by Industrial Revolution 4.0 in Sarawak remains unexplored.

The second proposition of the JD-R theory suggests that engagement predicts organisational commitment, whilst the theory's seventh proposition suggests that motivated employees are more capable of generating job resources (Bakker and Demerouti 2017). Congruently, the B&B theory posits that positive emotions will positively influence prosocial behaviour (Good et al. 2016). Thus, H5 is formulated.

H5: Employee engagement positively influences organisational citizenship behaviour.

2.3.6 PsyCap and OCB

Luthans, Youssef, and Avolio (2007) asserted the potential of PsyCap as a facilitating ground for progressive change through display of positive behaviour at work, such as OCB. Avey, Luthans, and Youssef (2009), Norman et al. (2010), Beal, Stavros, and Cole (2013), Pouramini and Fayyazi (2015), Pradhan, Jena, and Bhattacharya (2016), Gupta, Shaheen, and Reddy (2017) congruently found a positive association between PsyCap and OCB that propels both individual and organisational success.

While empirical evidences on the positive association between PsyCap and OCB in Western and Eastern contexts were established, little is known on the relationship in a Malaysian context. Chelliah et al. (2016) found a positive relationship between self-efficacy and commitment towards employing organisations in the Sarawakian construction industry. Despite the exclusion of the three dimensions of PsyCap, namely, hope, resilience, and optimism, a direction for research on the relationship between PsyCap and OCB in a local context was provided. Furthermore, only few studies on antecedents of OCB were conducted in knowledge-intensive contexts or where learning provision is concerned (Salas-Vallina, Alegre, and Fernandez 2017). Given that intensive learning is required in the Industrial Revolution 4.0 era, findings of this study might offer substantial value to extant literature. Citing instability of emotion and cognition among youth as reasons for lower engagement levels in OCB (O'Driscoll and Roche 2017), this study posits that PsyCap- a relatively stable psychological state dominated by positive emotions and cognition is positively associated with OCB among youth participants of Industrial Revolution 4.0 in Sarawak.

The effects of personal motivation on training effectiveness remain understudied within the KTEM domain (Bates 2004; Baldwin, Ford, and Blume 2017). Similarly, Grover et al. (2018)

found that PsyCap, as a personal resource, poses direct influences on perceptions of job demands-resources and engagement respectively, but it “neglects the boundary conditions and effective interventions” that result in desirable organisational outcomes. Another study by Bruning and Campion (2018) assessed the outcomes of job crafting through role and resource crafting but neglected the pathway resulting in social expansion and work role expansion which reflect the multi-faceted OCB adopted in this study. Therefore, theoretical support to this hypothesis is made with reference to Frederickson’s B&B theory, whereby positive affect leads to broader actions. With the reinforcement of benefits of approach role-crafting behaviour encompassing social and work role expansion behaviour on organisational outcomes, extant literature, theoretical foundations and identified literature gaps, H6 is suggested.

H6: Psychological capital positively influences organisational citizenship behaviour.

2.3.7 TOT and OCB

To date, literature have shown inconsistent results and inconclusive outcomes on the effect of TOT on work environment (Blume et al. 2010; Blume et al. 2019), which the study seeks to address through the relationship between TOT and OCB. According to Okurame (2012), the linkage between career growth prospects, such as training and the display of OCB is virtually absent. In exact, scant literature has explored the influence of TOT on OCB (Memon et al. 2017).

Nik Nazli and Khairudin (2018) found that TOT exerts positive effect on OCB in the Malaysian public service context. Nevertheless, there remains substantial value to scrutinize the relationship between said variables with consideration of contextual variation. Nik Nazli and Khairudin’s (2018) study focused on the civil defence force, whose desired set of skills are relatively stable. In contrast, this study shall be conducted on youth participants of Industrial Revolution 4.0 in Sarawak. Therefore, the digital competencies incorporated in the TOT construct of this study differ from the work of Nik Nazli and Khairudin (2018). It is again reiterated that the nature of skills being trained may influence TOT displayed (Blume et al. 2010).

From a theoretical standpoint, the JD-R theory suggests that the presence of a job resource would instigate commitment among employees (Bakker and Demerouti 2017). Therefore, this study suggests that TOT, as a sustainable job-resource, will elicit OCB- a form of extra-role commitment among participants of this study. Moreover, the KTEM model suggested that the value of training is only evident if positive results are generated at the workplace (Kirkpatrick 1996; Steensma and Groeneveld 2010; Nik Nazli and Khairudin 2018).

As such, H7 is proposed.

H7: Transfer of training positively influences organisational citizenship behaviour.

2.3.8 Role of TOT as a Mediator in the Relationship between EE and OCB

According to Hayes (2009), the inclusion of mediating variable may facilitate understanding on the causal sequence resulting in an effect.

Pertaining to unresolved issues with training transfer (Baldwin, Ford, and Blume 2017; Blume et al. 2019) and employers' hesitation in training provision, TOT is proposed as a mediator to the relationship between EE and OCB to examine the role of motivation in determining training effectiveness at both behavioural and organisational impact levels, which remains a vague area within training transfer literature governed by the KTEM model (Bates 2004; Baldwin, Ford, and Blume 2017), as well as (ii) to examine the effective interventions that results in desirable organisational outcomes (Grover et al. 2018). In other words, insights on how the presence of a job resource would bridge motivation and approach role-crafting could be obtained by examining the mentioned relationship.

EE is defined as a positive, fulfilling, and mindful state of motivation focused on work characterised by vigour, dedication, and absorption (Schaufeli et al. 2019; Hakanen et al. 2019). Work engagement is seen as a relatively stable and enduring positive psychological state (Schaufeli et al. 2002), as compared to personal engagement which is prone to fluctuations between the extremes of engagement and disengagement (Kahn 1990).

TOT, on the other hand, is defined as trainees' choice to discard, maintain, apply, or modify work elements (Baldwin, Ford, and Blume 2017) and sustaining them over time (Baldwin and Ford 1988). Effective training itself is capable of leveraging skills, knowledge, and attitudes possessed by employees to deal with work situations (Blume et al. 2010). In exact, TOT constitutes job resources that encourage achievement of work-goals, reduction of demands- *be it physically or psychologically*, and foster personal growth, learning and development capacities (Bakker and Demerouti 2017). In this study, elements of digital competency have been incorporated in the TOT construct and takes on the role of job resources.

The dependent variable of this study, OCB, takes on Williams and Anderson's (1991) two-dimensional operationalisation consisting of individual-directed OCB (OCB-I) and organisation-directed OCB (OCB-O) where the former comprises of altruism and courtesy while the latter is characterised by conscientiousness, civic virtue, and sportsmanship. The former dimension additionally captures interpersonal helping (Graham 1989), peacekeeping and cheerleading (Organ 1990; Ocampo et al. 2018), as well as interpersonal facilitation (Van Scotter and Motowidlo 1996); while the latter accommodates organisational loyalty (Graham

1991), job dedication (Van Scotter and Motowidlo 1996), endorsement of organisational objectives (Borman and Motowidlo 1997), voice behaviour that provides constructive feedback for improvements (Van Dyne and Lepine 1998), proactiveness in taking charge (Morrison and Phelps 1999), as well as being concern towards organisational image (Farh, Zhong, and Organ 2004). This study suggests synonymity between Williams and Anderson's operationalisation of OCB and approach role-crafting which hosts social expansion and work expansion as these behaviours are directed towards the maintenance and improvement of psychological and social context that reinforces task performance at the workplace (Organ 1997; Bruning and Campion 2018).

As mentioned in earlier sections, emotional responses and their influence on job resources remains an ambiguous area within the JD-R theory (Bailey et al. 2017; Bakker and Demerouti 2017). On the other hand, the B&B theory endorses the influence of positive emotions at reducing differences between individuals, strengthening interpersonal relationships, and offering opportunities in promoting interdependence (Vacharkulksemsuk and Fredrickson 2013). The B&B theory also suggests that positive emotions broadens an individual's intellectual, physical, social, or psychological resources to facilitate coping (Fredrickson 2004b; Vacharkulksemsuk and Fredrickson 2013). Therefore, examining the influence of the positively fuelled EE on OCB will validate theoretical claims that positive emotions lead to social resources, while the potentially mediating role of TOT substantiates theoretical understanding on how positive emotions will advance social and work role expansion when essential job resources are acquired.

TOT has established mediating properties in Nik Nazli and Khairudin's (2018) study on the association between work engagement and OCB. Following the likes of extant literature, H8a is proposed.

H8a: Transfer of training mediates the relationship between employee engagement and organisational citizenship behaviour.

2.3.9 Role of TOT as a Mediator in the Relationship between PsyCap and OCB

Grover et al. (2018) suggested ambiguity on the interaction between PsyCap as a personal resource on job resources and "neglect of the boundary conditions and effective interventions" that results in desirable organisational outcomes. Another study by Bruning and Campion (2018) assessed the outcomes of job crafting through role and resource crafting but neglected the pathway resulting in social expansion and work expansion- umbrella terms to the dependent variable of this study- OCB. Social expansion represents proactive alignment of prosocial resources to an individual's task, of which may yield benefits such as increased

work meaning, cognitive engagement, and reduced strain; whilst work expansion refers to the proactive extension beyond formally specified work roles to improve individual wellbeing (Bruning and Campion 2018). Additionally, persistent issues with training effectiveness due to lack of understanding on personal factors require attention (Bates 2004; Baldwin, Ford, and Blume 2017). Following the proposed shift in conventional expectations of the exchange relationship between employees and their organisations, and the outlined discrepancies from both studies, a pressing need to bridge the relationship between PsyCap and OCB was identified through the presence of a job resource, TOT, was identified.

PsyCap represents a combination of cognitive abilities and positive affect (Norman et al. 2010; Luthans and Youssef-Morgan 2017; Nolzen 2018). Recalling on the inconsistencies between the role and resource-based perspectives of job crafting behaviour (Zhang and Parker 2018; Bruning and Campion 2018; Lazazzara, Tims, and de Gennaro 2020) which resulted in neglection of the role of cognition in generating job resources and subsequently, its influence on social expansion and work-role expansion; further substantiated with the shortcoming of the JD-R theory in addressing contextual factors and personal reactions which elicits demands and resources experienced by employees (Bailey et al. 2017; Bakker and Demerouti 2017), examining the mediating role of TOT between PsyCap and OCB may offer valuable insights. Additionally, broadened cognition is capable of determining positive emotions (Garland, Gaylord, and Fredrickson 2011; Vacharkulksemsuk and Fredrickson 2013; Chen, Allen, and Hou 2020) and prosocial behaviour (Good et al. 2016).

Furthermore, TOT has proven its potential as a mediator in several studies (Bates and Khasawneh 2005; Wang et al. 2010; Nik Nazli and Sheikh Khairudin 2018). Bates and Khasawneh (2005) scrutinized on the mediating role of TOT in the “learning culture and organization innovation relationship”, Wang et al. (2010) studied TOT as a mediator in the job-related training and firm-specific learning relationship. Additionally, Grover et al. (2018) has utilised job demands and resources as a mediator in their study on the effects of PsyCap on wellbeing and engagement. As TOT is operationalized as a job resource in this study, H8b is proposed.

H8b: Transfer of training mediates the relationship between psychological capital and organisational citizenship behaviour.

2.4 Summary of Literature Gaps

In summary, there are five main literature gaps which this study seeks to cover. First, the KTEM model falls short of explaining individual factors, particularly motivation in enhancing training effectiveness (Bates 2004; Reio et al. 2017; Baldwin, Ford, and Blume 2017). Second, there remains insufficient knowledge on the influence of personal resources on approach role crafting and interplay of the former with job resources (Bruning and Campion 2018; Grover et al. 2018). Third, there are limited knowledge on psychological processes that elicit demands and resources due to the shortcoming of the JD-R model in addressing emotional responses and contextual factors that generate resources for employees (Bailey et al. 2017; Bakker and Demerouti 2017). Fourth, despite the growing interest in skills for the future workforce, the identification of digital competencies for practical use remains scarce (Janssen et al. 2013; Murawski and Bick 2017). Lastly, the lack in practicality of extant engagement and psychological capital studies on human resource management practices (Bailey et al. 2017; Nolzen 2018) may be the underlying reason for unresolved issues with training transfer (Baldwin, Ford, and Blume 2017; Blume et al. 2019).

This study attempts to address the aforementioned cues in the following manner. First, the study aims to understand the influence of personal motivations, namely PsyCap as a personal resource and EE as a work-related motivation on training effectiveness at behavioural (represented by TOT, a job resource) and organisational impact levels through approach role crafting (characterised by OCB). TOT is introduced to the model as a mediator in attempt to gauge the role of job resources in bridging motivation and resources that are beneficial to both the individual and organisation. Secondly, the study aims to propose a mediating effect of EE on the relationship between PsyCap and TOT, offer insights on how emotional influences will optimise the attainment of job resources as well as how the interplay between personal resources and job resources may be obtained. Third, digital competencies are incorporated into the TOT construct to develop an instrument which may assess the extent of training transfer to the workplace in the form of digital competencies.

2.5 List of Proposed Hypotheses

H1: Psychological capital positively influences employee engagement.

H2: Employee engagement positively influences transfer of training.

H3: Psychological capital positively influences transfer of training.

H4: Employee engagement mediates the relationship between psychological capital and transfer of training.

H5: Employee engagement positively influences organisational citizenship behaviour.

H6: Psychological capital positively influences organisational citizenship behaviour.

H7: Transfer of training positively influences organisational citizenship behaviour.

H8a: Transfer of training mediates the relationship between employee engagement and organisational citizenship behaviour.

H8b: Transfer of training mediates the relationship between psychological capital and organisational citizenship behaviour.

CHAPTER THREE: METHODOLOGY

3.1 Research Philosophy

Just as how theory is essential towards research, a research philosophy is equally imperative as the latter represents a researcher's beliefs on the nature of reality (Mills, Bonner, and Francis 2006). Such belief underpins the systematic process of collecting, analysing and using data to generate findings that may explain a real-world phenomenon (Crossan 2003; Saunders, Lewis, and Thornhill 2012; Žukauskas, Vveinhardt, and Andriukaitienė 2018). According to Saunders, Lewis, and Thornhill (2012), there are three main research philosophies governing social science researchers, namely, positivism, interpretivism, and pragmatism.

In the positivist's realm, the social world is objectively understood (Žukauskas, Vveinhardt, and Andriukaitienė 2018). Therefore, positivist researchers are likely to act independently and pursue highly-structured methodology to encourage replication of studies (Saunders, Lewis, and Thornhill 2012; Žukauskas, Vveinhardt, and Andriukaitienė 2018). Positivists establish generalisability of scientific knowledge and "cleanses scientific knowledge from speculation and subjective viewpoints" through the formal logic and the use of mathematics (Crossan 2003, 51). In other words, hypotheses are generated based on existing theories and thereafter statistically tested to enhance theoretical understanding or the phenomenon under investigation (Saunders, Lewis, and Thornhill 2012). Common research methods pursued by positivist researchers include survey, experiments, and non-quasi experiments (Žukauskas, Vveinhardt, and Andriukaitienė 2018).

Interpretivism, on the other hand, views social world with subjectivity (Žukauskas, Vveinhardt, and Andriukaitienė 2018). According to Levers (2013), interpretivist research is highly influenced by the researcher's belief and feelings towards how a real world phenomenon should be studied. The primary focus in interpretive realm is recognising human experiences and actions based on historical, cultural, and temporal circumstances (Žukauskas, Vveinhardt, and Andriukaitienė 2018; Saunders, Lewis, and Thornhill 2012). Typically, interpretivism studies are inductive in nature and are qualitative in terms of analysis (Saunders, Lewis, and Thornhill 2009).

Pragmatists seek to address ambiguity of the social world by reconciling both subjectivism and objectivism (Žukauskas, Vveinhardt, and Andriukaitienė 2018). In this paradigm, research is initiated by a research problem and ends with practical outcomes that inform future implications in research (Saunders, Lewis, and Thornhill 2009). A range of methods may be employed under this philosophical view (Saunders, Lewis, and Thornhill 2009; 2012).

This study is mainly driven by positivism as (i) the hypotheses are underpinned by theories and (ii) data collected will be statistically analysed to examine the relationships among the variables in this study, namely, PsyCap, EE, TOT and OCB, and the mediating effect of TOT on the relationships.

3.2 Direction of Theorising

Saunders, Lewis, and Thornhill (2012) suggest that the extent to which a researcher understands theory at the initial stages of research will influence research design. In other words, research design is affected by the researcher's approach to reasoning, which may exist in two forms, namely, deductive and inductive reasoning (Neuman 2014).

In deductive reasoning- *also known as theory testing*, the researcher starts off with a theoretical proposition that underpins the proposed relationship between variables and further evaluate these propositions against empirical evidence (Neuman 2014). Contrarily, inductive reasoning- *otherwise known as theory building*, begins with empirical evidence and subsequently leading to the development of abstract concepts or theoretical propositions (Ketokivi and Mantere 2010; Neuman 2014; Saunders, Lewis, and Thornhill 2012).

This study assumes deductive reasoning as this study is focused on theory testing in the JD-R, B&B, KTEM, and SET domain of which the hypotheses were built on. Furthermore, empirical evidence will be collected through a survey and subsequently analysed as means of evaluating the propositions set forth.

3.3 Study Technique

Qualitative studies are best chosen in cases where a research problem is known, but not the variables or needs (Creswell and Guetterman 2019). Given its exploratory nature, a range of non-standardised data collection techniques is employed to ensure that the research process is naturalistic and interactive (Saunders, Lewis, and Thornhill 2012, 163). The researcher is highly involved in qualitative studies, and therefore, exposes the findings to the researcher's subjective reflexivity and bias (Neuman 2014; Creswell and Guetterman 2019).

According to Creswell and Guetterman (2019), one of the major traits of quantitative research is the identification of a research problem which may arise as a trend or a need to explain the relationship between variables. This aligns with the training transfer problem which this study seeks to address. Low training transfer rates cause a disequilibrium between young employees' needs and organisational returns- a vicious cycle which further discourages training provision and eventually, affecting workforce readiness in securing digital dividends offered by

Industrial Revolution 4.0. It was suggested that training transfer issues originate from the lack of personal motivations (Elliott, Dawson, and Edwards 2009).

Additionally, a critical literature review is crucial to justify the research problem whilst suggesting research questions and objectives of a study (Creswell and Guetterman 2019). In other words, literature gaps are intertwined with practical gaps. Reflecting on the practical gap stated earlier in this section, four gaps in literature were identified, namely, (i) the influence of personal resources on job demands-resources and its pathway leading to social expansion (Bruning and Campion 2018; Grover et al. 2018), (ii) addressing psychological processes that elicit demands and resources (Bailey et al. 2017; Bakker and Demerouti 2017), (iii) identification of digital competencies for practical use (Janssen et al. 2013; Murawski and Bick 2017), and lastly (iv) practicality of extant of EE and PsyCap knowledge on human resource management studies (Bailey et al. 2017; Nolzen 2018). These shortcomings in extant literature justify the unresolved problems with transfer of training (Baldwin, Ford, and Blume 2017; Blume et al. 2019). The research questions, objectives, and hypotheses of this study revolve around four variables, namely: PsyCap, EE, TOT and OCB. The relationship between these chosen variables may explain how PsyCap and EE may encourage TOT, how PsyCap and EE may lead to social expansion through the display of OCB, and the extent which TOT will mediate relationships between PsyCap and OCB, as well as EE and OCB respectively.

Quantitative research also calls for the collection of numerical data from a pool of respondents by using pre-determined instruments and further analysed using a range of statistical techniques to generate findings using “standard structures and fixed evaluation criteria” (Saunders, Lewis, and Thornhill 2012, 162; Neuman 2014; Creswell and Guetterman 2019, 13). Surveys will be administered to study participants to obtain a quantitative description of relationships between the constructs (Creswell and Guetterman 2019) of this study, namely, EE, PsyCap, TOT and OCB. A non-experimental survey design is chosen for this study as it is “useful and powerful in finding answers to research questions” (Sekaran 2003, 264).

The objectivity of measuring instruments deployed in any quantitative research can be justified through reliability and validity testing (Park and Park 2016). In other words, quantitative research allows unbiased prediction and maximises the objectivity when examining a social phenomenon (Park and Park 2016). There is also minimal interference from the researcher in conducting quantitative research (Muijs 2010). These qualities show the compatibility between quantitative research, positivism and deductive reasoning. Given the suitability of quantitative research in explaining a phenomenon through hypotheses testing and its good ability in justifying theories (Muijs 2010; Creswell and Guetterman 2019), this study opts for a non-experimental survey technique which is quantitative in nature.

3.4 Research Design

3.4.1 Unit of Analysis

The first step in collecting quantitative data is identifying the unit of analysis of a study (Creswell and Guetterman 2019, 139). The unit of analysis represents the subject which the researcher obtains information from and subsequently generalises on them (Lewis-Beck, Bryman, and Futing Liao 2012). Given the substantial interest from the national and state government in developing youth talents for the Industrial Revolution 4.0 era, the complacency among organisations in provision of training opportunities, further supported by the detrimental lack in resources among youth to handle dynamic work demands, this study seeks to gather data from Sarawakian youth who have undergone Industrial Revolution 4.0 at an individual level. Other scholars who have similarly adopted individuals as their unit of analysis include Memon et al. (2017) and Nik Nazli and Sheikh Khairudin (2018).

3.4.2 Points in Time

According to Neuman (2014, 44), time is an essential dimension of a study. To date, there remains two basic kinds of research surveys, namely, cross-sectional and longitudinal research surveys (Saunders, Lewis, and Thornhill 2012; Neuman 2014; Creswell and Guetterman 2019).

In cross-sectional research, data is collected at a single point in time; whilst data is collected over time in longitudinal research (Creswell and Guetterman 2019). In the words of Neuman (2014, 44), cross-sectional research provides “a snapshot” whereas longitudinal research provides a “moving picture” of a social phenomenon across time. While longitudinal studies are more powerful and more explanatory, they are relatively expensive, complicated, and require more resources compared to cross-sectional studies (Saunders, Lewis, and Thornhill 2012; Neuman 2014).

Contrarily, cross-sectional studies require relatively short timeframe and are inexpensive to conduct (Saunders, Lewis, and Thornhill 2012; Neuman 2014). Despite disputes on the suitability of cross-sectional design for mediation studies due to observational-time constraint (Maxwell and Cole 2007; Bono and McNamara 2011), mediation studies assuming wholly cross-sectional methods have blossomed in recent years (Memon et al. 2017a; Nik Nazli and Sheikh Khairudin 2018). Despite not being able to prove causality, cross-sectional studies are helpful in generating causal hypotheses (Jacob and Ganguli 2016), as proposed in an earlier chapter of this thesis.

3.4.3 Population

In survey-based research, researchers often select samples from a population to enable generalisation of results obtained from the sample to the population (Creswell and Guetterman 2019). According to Saunders, Lewis, and Thornhill (2012, 260), population refers to a “full set of cases from which a sample is taken” and is the broadest unit of elements (Gray 2004, 82; Creswell and Guetterman 2019, 390).

Youth are highly influential towards future development trends of the society and nation which they belong to (Amir Zal, Abu Samah, and Redzuan 2012). Often recognised as pillars of socioeconomic advancement, human capital development, and nation building (Amir Zal, Abu Samah, and Redzuan 2012), the state government of Sarawak similarly acknowledged the vast youth population in the state as an advantage to its transformation efforts into a digitally-driven state (Sarawak Government 2019). As baby boomers are inching close to retirement, youth are bound to shoulder larger roles in economic development (McKay 2019).

As stated in Section 1.1.3 in the first chapter of this thesis, the youth are most vulnerable in digitally-driven and dynamic business environment because they lack required resources (Demerouti, Peeters, and van der Heijden 2012; Upadyaya and Salmela-Aro 2017; Salmela-Aro and Upadyaya 2018). Approximately 54% of youth attributed their inability to develop requisite competencies to rare development opportunities (Armstrong et al. 2018). Further threatened by complacency among employers in providing training opportunities due to transfer of training issues (Training Workforce 2017; Mohd Ibrahim and Mahyuddin 2016), it is crucial to examine how personal motivations, represented by PsyCap and EE, may influence OCB and TOT respectively, and the extent to which TOT will mediate the relationship between PsyCap and OCB, as well as EE and OCB respectively. This is because the outcomes may encourage policy formulation and urge managerial practitioners in recognising the value of training to youth- particularly in Sarawak, a state which aims to digitally transform its economic sectors. Therefore, the population of interest of this study are working youth in Sarawak who have undergone Industrial Revolution 4.0 related trainings.

According to the Laws of Malaysia, under the Youth Societies and Youth Development Act 2007 (The Commissioner of Law Revision Malaysia 2014, 12), youth refer to persons aged not less than fifteen years old and not more than forty years of age. The state of Sarawak shares an equal definition of youth (Lumandan 2019). Therefore, the definition of youth in this study shall be confined to those between 15 to 39 years of age. On the other hand, a working person must have performed work and receives remuneration in wages, salary, tips, or any form of payment (International Labour Organisation 2003; Department of Statistics Malaysia n.d.).

The Department of Statistics Malaysia (2019) and Labour Department of Sarawak (2018) have estimated that youth in Sarawak account for 44.2% of the total working population in Sarawak, which is equivalent to 557,008 persons.

Industrial Revolution 4.0 related trainings are broadly classified into three branches, namely, Technical and Vocational Education and Training (TVET), digital-upskilling, and soft-skills training. These branches were specifically outlined in the Sarawak Digital Economy Strategy 2018-2022 blueprint (State Service Modernisation Unit 2017). TVET is widely recognised as an enabler of Industrial Revolution 4.0 due to forecasted demands in upper-level technical positions across economic sectors (Alias and Hamid 2018; Liew 2019; Department of Skills Development Malaysia 2019). Without doubt, the digital and soft-skills are imperative in dealing with Industrial Revolution 4.0 challenges (Hecklau et al. 2016; Andriole 2018). The number of working youths in Sarawak who are trained under Industrial Revolution 4.0 remains unknown as the authorities are unable to disclose the numbers due to confidentiality or unavailability of records due to disperse population.

3.4.4 Sampling Method

While it may be difficult to study the whole population (Creswell and Guetterman 2019), sampling- defined as the selection of a subset within a population, may prove to be advantageous in terms of cost, time, and effort, while allowing the generation useful, valid, and reliable findings (Daniel 2014c). Due to the unavailability of both population and sampling frame (Heckathorn 1997; Cohen and Arieli 2011; Daniel 2014a), this study adopts a combination of purposive and snowball sampling, of which both are non-probability sampling methods.

While acknowledging the weaknesses of non-probability sampling in terms of representativeness of the population under study, ability to generalise from the sample, and its susceptibility to selection bias (Daniel 2014a; Etikan 2016), the mentioned sampling method has its own strengths which suits the needs and contingencies of this study.

First, the involvement of specific elements of the population in this study makes non-probability sampling a better option (Daniel 2014a). As mentioned in Section 3.4.3, the target population of this study is working youth in Sarawak whom have undergone Industrial Revolution 4.0 related trainings. Second, the candidate has experienced difficulties in gaining access to the population (Daniel 2014a) for legal reasons. Training providers have rejected to render assistance as the Personal Data Protection Act (2010) restricts them from disclosing trainees' information to a third party. Therefore, the candidate is unable to obtain a list of trainees who have attended Industrial Revolution 4.0 training. Fourth, the use of non-

probability sampling in this study is reasonable as the candidate has limited resources and time (Etikan 2016). Furthermore, Sarawak is in its initial stages of developing an agile workforce for Industrial Revolution 4.0, where such young talents may not be easily available (Etikan 2016).

To ensure that the sample consists only of those under the target population, this study included a “Constraints on Generality” statement which stringently identifies the criteria of the target population that shall be generalised upon (Simons, Shoda, and Lindsay 2017; Goldberg et al. 2019). Furthermore, given the exploratory nature of this study, non-probability sampling demonstrates higher suitability over probability sampling (Daniel 2014a).

Purposive sampling requires a researcher to specify a set of criteria and exercise their best judgement to select participants that enables research objectives to be achieved (Saunders, Lewis, and Thornhill 2012; Malhotra, Nunan, and Birks 2017; Creswell and Guetterman 2019). Examples of extant studies which has adopted purposive sampling are the works of Tan, Lew, and Sim (2020) among New Zealand social workers, Zumrah et al. (2020)’s study on the Malaysian public sector organisations’ trainees, as well as Ng et al. (2020)’s study among Generation Y tourists in Malaysia. According to Magnani et al. (2005), snowball sampling is useful in recruiting a larger number of samples for the study in cases where the population is not easily accessible. Existing participants of the study are to recruit future subjects among their acquaintances whom share the same characteristics as they do (Naderifar, Goli, and Ghaljaie 2017). In this study, the research candidate identified eligible respondents from various organisations in Sarawak and requested the respondents to refer acquaintances who have similarly undergone Industrial Revolution 4.0 training and are working in Sarawak; while exercising snowball sampling to recruit more respondents.

Procedural and statistical remedies will be exercised to mitigate common method bias, which may arise as a result of high self-selection probability in circumstances where non-probability sampling is exercised (Podsakoff et al. 2003).

3.4.5 Sample Size

A common aim shared among survey researchers is to obtain data representative of a population (Bartlett, Kotrlik, and Higgins 2001, 43; Creswell and Guetterman 2019). According to Creswell and Guetterman (2019, 143), the larger the sample extracted from a population, the less likely sampling error would occur. However, the precision of results do not necessarily increase as sample size increases (Neerchal, Lacayo, and Nussbaum 2008).

One way of determining required sample size is through the use of Cochran's Sample Size Formula (1977), as follows:

$$n_0 = \frac{z^2 pq}{e^2} = \frac{1.96^2 [0.5 \times (1 - 0.5)]}{0.05^2}$$

Where,

n_0	=	Sample size
z^2	=	Abscissa of the normal curve that cuts off an area, α at the tails <i>Note: Based on statistical table, z value for a 95% confidence interval is 1.96</i>
p	=	Estimated proportion of an attribute present in a population
q	=	Confidence interval
e	=	Level of precision

The mentioned formula suggests 384 samples to achieve required confidence levels where the exact population number is unknown. Assuming all 557,008 working youth in Sarawak are trained in Industrial Revolution 4.0 areas, the required sample size, as suggested by (Krejcie and Morgan 1970) would be 381 persons.

While the number of trained youth in Industrial Revolution 4.0 modules remain anonymous, Krejcie and Morgan (1970, 610) suggested that "as the population increases, the sample size increases at a diminishing rate and remains relatively constant at slightly more than 380 cases". However, researchers should be reminded that various factors such as accessibility, funding, the population number as a whole, or number of variables may influence sample size (Daniel 2014b).

Sekaran (2003, 264) reiterated Roscoe's (1975) rule of thumb in determining sample size, where the sample size should be preferably ten times or more or as large as the number of variables in multivariate studies. Based on Roscoe's rule of thumb, this study ought to have a minimum of 40 samples as there are four variables. The 1:10 rule of thumb is similarly suggested by Hair, Ringle, and Sarstedt (2011), with its variation claiming that the sample size in PLS-SEM should be ten times the maximum number of model links pointing at any variable in a model. Nevertheless, such rules may result in inaccurate estimations of minimum sample size required (Kock and Hadaya 2018, 6).

The importance of minimum sample size required should not be underestimated as it warrants adequate statistical power of results (Hair et al. 2017, 23) to ensure rightful rejection of a false null hypothesis (Goodhue, Lewis, and Thompson 2012; Kock and Hadaya 2018; Creswell and Guetterman 2019). In other words, the number of samples exerts influence on statistical power, in which the latter is important in avoiding type II errors (Jacob Cohen 1992; Kock and Hadaya 2018). Memon et al. (2018) particularly asserted the importance of sample sizes in mediation analysis.

Contrary to aforementioned methods of determining sample sizes, Creswell and Guetterman (2019) recommended power analysis as a rigorous and systematic approach in calculating the minimum sample size for a study. A researcher may opt to conduct power analysis using either Cohen (1992)'s power chart or a stand-alone power analysis programme- G*Power. G*Power has gained popularity among social and behavioural researchers due to its ability in computing power analyses with minimal errors (Faul et al. 2007, 175). Studies have also adopted the use of G*Power in computing their required sample sizes (e.g. Amir Zal, Abu Samah, and Redzuan 2012; Tan, Lew, and Sim 2019). As suggested by Tan, Lew, and Sim (2019), "there is no reason to use approximate method as opposed to exact methods of calculation".

Generally, the number of predictors, effect size, and statistical power are crucial elements in conducting power analyses to determine the minimum sample size required for a study (Kock and Hadaya 2018). Effect size refers to the discrepancy between the respective values of the null and alternate hypotheses (Jacob Cohen 1992, 98), or "magnitude of an effect that is independent of a sample size analysed" (Kock and Hadaya 2018, 4). Conventionally, effect sizes of 0.02, 0.15, and 0.35 are respectively recognised as small, medium and large effects (Cohen 1992; Kock and Hadaya 2018). As an effect size of 0.15 is commonly used in conducting power analyses (Kock and Hadaya 2018), this study shall follow suit.

The second component in power analysis- statistical power, refers to a coefficient of association and sample size for samples drawn from a population, at a given significance level of $P < 0.05$ ". The general acceptable level of statistical power to avoid Type II error is a statistical power of 80% (Goodhue, Lewis, and Thompson 2012; Kock and Hadaya 2018; Creswell and Guetterman 2019).

The three predictive variables of this study are identified as PsyCap, EE, and TOT. PsyCap and EE are exogenous variables that are predictive of the endogenous variable- OCB. TOT, on the other hand, is identified as an endogenous variable due to its potential role as a mediator to the relationships between PsyCap and OCB, as well as EE and OCB. By computing these values into G*Power, the minimum sample size required for this study is 77.

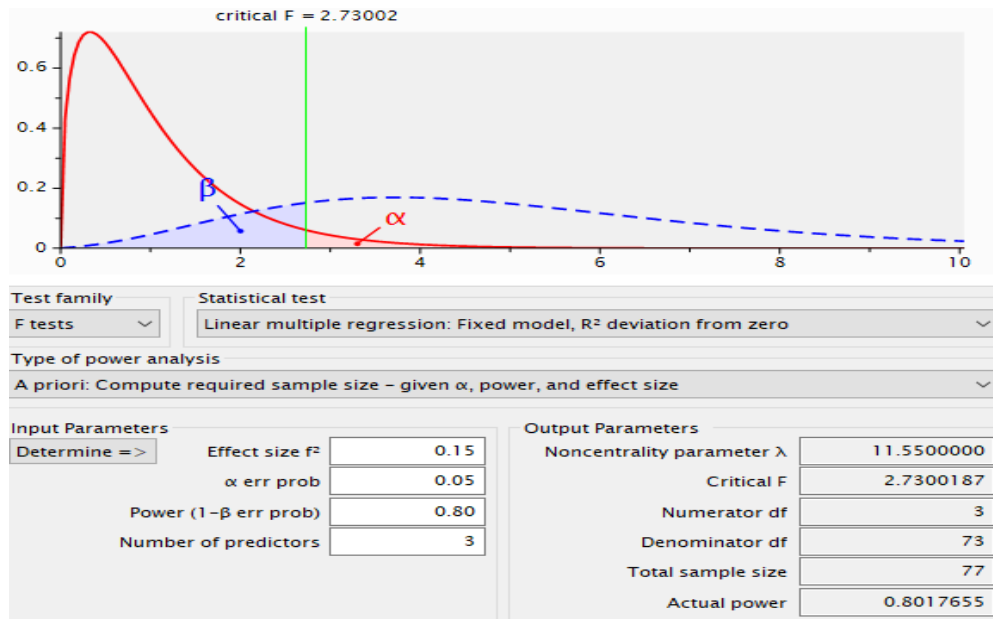


Figure 3: Minimum Sample Size Computed using G*Power

Most recently, Kock (2018) suggested two methods of estimating minimum sample size required for partial least squares structural equation modelling (PLS-SEM) based studies, namely, the inverse root method and the gamma-exponential method. More specifically, Kock (2018) suggested the inverse root method for its ease of application and accuracy. Based on a variety of Monte Carlo experiments carried out (Kock and Moqbel 2016; Kock and Hadaya 2018; Kock 2018), a minimum sample size of 160 is suggested in instances where the researcher is uninformed of the path coefficient value with the minimum absolute magnitude (Kock 2018, 13). The inverse root method is also capable of reducing “bias due to capitalisation error”, enhances robustness, and ensure that sufficient power has been achieved in any studies (Kock 2018, 14). Therefore, the inverse-root method is utilised as a benchmark in this study.

3.4.6 Data Collection Method

According to Saunders, Lewis, and Thornhill (2012), quantitative research is primarily associated with survey and experimental forms of research, whilst survey is commonly adopted in circumstances where reasoning is deductive in nature. The primary data in this study is collected through means of survey. An investigator would administer surveys to a study sample to gauge insights on the attitude, behaviour, characteristics, or opinions of the target population (Creswell and Guetterman 2019). Subsequently, the data collected would be analysed to generate findings for a set of hypotheses. Thereafter, findings will be interpreted based on prior studies (Creswell and Guetterman 2019).

As described in Section 3.4.2, a cross-sectional survey design is adopted for this study. Due to time and resources constraints, cross-sectional survey best caters to this study given its relatively shorter timeframe in administrating the survey and obtaining required information. By adopting a survey strategy, the researcher may find relationships between variables and generate a model on the relationships (Saunders, Lewis, and Thornhill 2012).

This study opted for a mixture of paper-based survey and web-based survey considering the advantages and disadvantages of both methods. The online survey was hosted on SurveyMonkey. Respondents are able to access the web-based survey form via a uniform resource locator (URL) embedded in the recruitment email or the WhatsApp recruitment message. The web-based survey form is advantageous due to its ability to reach a larger pool of geographically dispersed location at a minimal cost (Evans and Mathur 2005; 2018). Furthermore, by turning off the IP Address locator in the web-based survey form settings, the anonymity of respondents is assured. A logic filter was applied to filter questions in the third section of the final instrument, of which respondents who responded “no” will be directed to the disqualification page. However, a higher likelihood for low response rates is widely associated with web-based surveys (Evans and Mathur 2018). In fact, the research candidate experienced many instances where the respondents exited the survey prior to completion during the data collection period. The low response rates were also attributed to receiver’s perception as junk mail (Creswell and Guetterman 2019). Generally, key personnel in the organisations which the candidate approached forwarded the recruitment email to potential respondents who satisfy the criteria of (1) being trained under Industrial Revolution 4.0 related initiatives, (2) is a youth, and (3) works in Sarawak. Online respondents were provided with the research candidate’s contact email to enable potential respondents to raise questions, if the need arises. Besides, to mitigate possibility of non-response bias, the research candidate has requested key personnel in the organisation to forward reminders to the recipient where possible (Andridge et al. 2019).

Due to requests from organisations and individuals for the paper-based survey form, as well as concerns on violation of the Personal Data Protection Act through email recruitment, as mentioned in Section 3.4.4, the research candidate administered physical survey forms. The collection process commenced with a brief which included details of the candidate, the purpose of conducting the study, their voluntary participation, anonymity of respondents, and clear instructions in answering the questionnaire. According to Creswell and Guetterman (2019), this researcher-administered survey method yields high response rates as the respondents feel obligated to complete the survey. In addition, the research candidate received an encouraging number of potential respondents over the course of paper-based survey administration. In

addition, as a measure of procedural remedy for CMV, as well as mitigating non-response bias, the research candidate collected the responses from the respondents right after completion.

3.5 Development of Survey Instruments

3.5.1 Development of Survey Items

3.5.1.1 Psychological Capital Questionnaire (PCQ)

The PsyCap construct in this study is measured using the 24-item Psychological Capital Questionnaire (PCQ) developed by Luthans et al. (2007). All four dimensions, namely, hope, self-efficacy, resilience, and optimism are represented by six items respectively. A six-point Likert scale is used, from which respondents may choose a scale number ranging from (1) “Strongly Disagree” to (6) “Strongly Agree” to express their opinion on the statements.

This study chooses to adopt PCQ for four reasons. First, the instrument was built on a strong foundation of established scales on its four dimensions, hope (Snyder et al. 1996; Snyder 2002), self-efficacy (Parker 1998), resilience (Wagnild and Young 1993), and optimism (Scheier and Carver 1985). Second, PCQ has been used in the works of Beal, Stavros, and Cole (2013), Alessandri et al. (2018), and Gupta and Shaheen (2018) with composite reliabilities of 0.91, 0.83, and 0.93 respectively- all of which are within the acceptable range (Peterson and Kim 2013). According to Creswell and Guetterman (2019), an instrument is deemed reliable and accurate if scores are internally consistent across the instrument. Composite reliability is one way to assess internal consistency (Peterson and Kim 2013). Third, the PCQ has dominated organisational studies (Timo et al. 2016), and lastly, PCQ has been utilised in most studies on PsyCap (Avey et al. 2011).

Following Nolzen's (2018) call to assess PsyCap as a higher-order construct, accompanied by Hair et al.'s (2018) assertion that higher construct models increase the parsimony and ease of apprehension of path models, the first-order level of PsyCap is operationalised reflectively while its second-order level is specified formatively in this study. Extant literature which called for examination of PsyCap as a higher order construct include the works of Luthans and Youssef-Morgan (2017); Tan, Lew, and Sim (2018) as well as Grover et al. (2018).

3.5.1.2 Utrecht Work Engagement Scale (UWES-9)

The construct of EE shall be measured using the 9-items Utrecht Work Engagement Scale (UWES-9) developed by Schaufeli, Bakker, and Salanova (2006). The instrument is comprised of three dimensions, namely, vigour, dedication, and absorption, each represented by 3 items. Respondents are required to choose from a 7-point Likert scale with the values ranging from (0) “Never” to (6) “Everyday”.

This study has chosen to adopt UWES-9 for the following reasons. First, UWES-9 has been used widely over the past decade to measure employees' wellbeing and investigate facilitating conditions under which employees flourish (Schaufeli and Bakker 2010; Bakker and Demerouti 2017). According to Bailey et al. (2017), 86% of studies on engagement were examined using UWES. Second, UWES has maintained a good composite reliability of 0.86 in Schaufeli, Bakker, and Salanova's (2006) study, 0.90 in Bakker and Sanz-Vergel's (2013) study, and 0.93 in Grover et al.'s (2018) study. In fact, the UWES-9 is said to possess "more robust construct validity across various occupational groups and greater time invariance" (Bailey et al. 2017, 35).

Following the specification of PsyCap, this study shall specify the first-order level of EE reflectively and its second-order level formatively. Such specification has also been deployed in the works of Hoole and Bonnema (2015) and Sinval et al. (2018).

3.5.1.3 Transfer of Training-Digital Competency Scale (TOT-DC)

As mentioned in earlier chapters of this study, the lack in identification of digital competencies for practical use must be addressed in response to concerns on the readiness of the Sarawakian workforce to embrace Industrial Revolution 4.0. According to Dufva and Dufva (2019) and Pacchini et al. (2019), humans serve as intermediaries between digital and physical systems governing Industrial Revolution 4.0 initiative. Due to the unavailability of instrument to measure digital competency which accounts for TOT, a scale is developed. The purpose of the TOT-DC scale is to identify the extent to which individuals are able to discard, maintain, apply, and modify training outcomes at work (Baldwin, Ford, and Blume 2017). In other words, the infusion of digital competencies in the TOT construct reflects the extent individuals would become digitally competent after attending training.

The three stages in developing the TOT-DC scale are: reviewing literature, constructing items, and pre-testing (Creswell 2012). Despite conflicting views on the use of exploratory factor analysis (EFA) in developing a new instrument, this study adheres to Mumtaz et al. (2017)'s advice, such that students may omit EFA provided that the questionnaire is well pinned with theories or literature and has undergone rigorous pre-testing. In such a manner, the TOT-DC scale was developed based on both theory and extant literature. Subsequently, the items were pre-tested prior to final administration of the survey. The final instrument consisted of 14-items encompassing dimensions of technical, methodological, social, and personal competencies, with the addition of a single global item.

Following Hecklau et al.'s (2016) conceptualisation of required competencies to thrive in the digital era, four categories encompassing the dimensions of technical, methodological, social, and personal competencies are adopted into this study.

The first dimension of TOT is characterised by technical competency. According to Hecklau et al. (2016,2), technical competency refers to job-related knowledge and skills. In this regard, literature suggests that the initial stage in becoming a digitally competent individual hinges on digital adoption (Colbert, Yee, and George 2016; Alam et al. 2018; Armstrong et al. 2018). Alam et al. (2018) suggested that digital adoption commences when an individual discovers the value in incorporating technological innovations into their activities. Besides, knowledge on ethical issues associated with the use of digital technologies and data, as well as the awareness of security measures are fundamental competences which the workforce should embrace in face of Industrial Revolution 4.0 (Hecklau et al. 2016; United Nations Economic and Social Council 2018). The susceptibility of digital contents to potential attacks over various points of the information network calls for cybersecurity practice (Dufva and Dufva 2019).

Methodological competency refers to problem-solving and decision-making abilities and skills (Hecklau 2016,2). Digital fluency refers to an individual's ability in leveraging digital technologies to manipulate information, construct ideas, and achieve strategic goals (Hsi 2007; Colbert, Yee, and George 2016). Colbert, Yee, and George (2016, 732) shared Briggs and Makice's (2012) view on digital fluency as one of the most important aspects that forms "competencies of the digital workforce". Philbeck (2017, 90), the United Nations Economic and Social Council (2018) and (Caruso 2018, 380) asserted the superiority of human cognitive ability in areas of creativity, critical thinking, and judgement as vital requisites of the digital workforce.

Social competencies, on the other hand, refers to the attitude, skills, and capacity to collaborate and communicate with others in digital environments (Hecklau 2016,2). Interpersonal relations, collaboration, and identity development are deemed as essential components of digital competency (Colbert, Yee, and George 2016; Dufva and Dufva 2019), alongside social intelligence and virtual collaboration (United Nations Economic and Social Council 2018; Hecklau et al. 2016).

The last component of digital competency, termed personal competencies, represent an individual's motivation, attitude and social values (Hecklau 2016,2). In a similar vein, Colbert, Yee, and George (2016), Alam et al. (2018), and Armstrong et al. (2018) posited that a digitally competent individual should possess lasting inclination and thought to lead a digitally enabled life while embracing digital transformations. Besides, knowledge on ethical issues associated with the use of digital technologies and data is seen as an imperative element in the digital age (Dufva and Dufva 2019). In a similar manner which the TOT construct is understood, the initial adoption of digital skills, knowledge, or attitude will progress into digital orientation,

where an individual continuously adapts to the rapidly evolving requirements of a digital workforce. Furthermore, the rapidly evolving nature of digital technologies calls for an open mindset towards development in the digital environment (Hecklau et al. 2016; United Nations Economic and Social Council 2018).

Hence, the derivation of items based on literature and their respective categories are tabulated as follows:

Table 1: Derivation of TOT Items and Categorisation

Technical Competencies	I use digital technology to improve work performance.
	I actively explore emerging digital technologies.
	I practice cybersecurity to protect my organisation's stakeholders' information (e.g. personal data, trade information).
Methodological Competencies	I use digital technology to express my creativity.
	I can identify problems at work accurately using digital technology.
	I am able to make decisions based on digital information.
Social Competencies	I am able to communicate with others effectively in digital environments.
	I am able to collaborate with others effectively in digital environments.
	I am able to share knowledge with others effectively in digital environments.
Personal Competencies	I am aware of ethical issues on the use of digital contents.
	I am open-minded towards new developments in the digital environment.
	I believe digital technologies complement human capital to benefit my organisation.
Global Item	Overall, training encouraged me to be digitally competent at work.

Respondents will rate their level of agreement based on a five-point Likert scale, ranging from (1) "Strongly Disagree" to (5) "Strongly Agree". The measurement model of the TOT construct assumes a reflective-formative measurement, with the second-order level specified reflectively, and the first-order level specified formatively as removal of any of the lower-order constructs would distort the meaning of digital competency.

3.5.1.4 Organisational Citizenship Behaviour 8-Item Scale

While a substantial amount of studies on OCB utilised Williams and Anderson's (1991) 14-item OCB scale, Lee and Allen (2002) suggested that the items may be tainted with dimensions of workplace deviance. In accordance with Lee and Allen's (2002) view, this study chose to adopt an eight-item OCB scale by Saks (2006), which was originally developed by Lee and

Allen (2002). Respondents may choose a score that best represents their opinion from a 7-point Likert scale with the values ranging from (1) “Never” to (7) “Always”.

The first reason of adopting the mentioned instrument are as follows. As this study intends to test causal hypotheses to examine how personal resources and job resources may lead to social expansion, Lee and Allen’s (2002) operationalisation of OCB, which suggested that citizenship behaviour is directed at the beneficiary is deemed appropriate. Second, the reliability of the instrument was established as Memon et al. (2017) reported a composite reliability value of 0.876. Beal, Stavros, and Cole (2013), on the other hand, reported composite reliability value of 0.95.

As the dependent variable in this study, the measurement model is investigated as a higher-order factor model assuming a reflective-formative specification, which is consistent with the works of Hoffman et al. (2007) and Memon et al. (2017b). Building on the works of Williams and Anderson’s (1991,612) and Podsakoff et al. (2009), where OCB-I and OCB-O were found to exhibit high correlations, and further supported by Rosen et al.’s (2018) call to examine OCB as an aggregate construct, this study shall examine OCB as a higher-order construct, assuming a reflective-formative specification. Furthermore, Lepine, Erez, and Johnson (2002), Hoffman et al. (2007), Beal, Stavros and Cole (2013), and Memon et al. (2017b) have equally suggested OCB as an aggregate construct.

3.5.2 Pre-Testing of Survey Questionnaire

Pre-testing is seen as an indispensable element of survey research by survey methodologists and experienced researchers (Ikart 2019). According to Sekaran (2003), pre-testing is crucial to eliminate ambiguity and inadequacies of a questionnaire, as well as reducing biases prior to administering a full-fledged survey. Other reasons for conducting a pre-test include improving data quality and reducing deletion of items and cases during measurement model assessment (Mumtaz et al. 2017). Dissimilar from pilot-testing, no statistical analyses are required for pre-testing of survey questionnaires (Mumtaz et al. 2017).

Kumar, Talib, and Ramayah (2012) reckoned that during the pre-testing process, (i) wording errors must be rectified, (ii) correct sequence of the questions must be ensured, (iii) the questions must be free from ambiguity, and (iv) ensure the clarity and adequacy of instructions. Regardless of whether the survey items are developed, adopted, or adapted, all survey items ought to be pre-tested to determine whether the questions “work accurately in a new setting” (Mumtaz et al. 2017, v).

The pre-testing of the survey questionnaire commenced with experts’ reviews. The research candidate engaged three experts who are experienced in survey research to assess the

questionnaire, as suggested by Ikart (2019). Feedback from the experts and the candidate's response are tabulated as follows:

Table 2: Expert's Opinion and Candidate's Response for the Pre-Test

Expert's Opinion	Candidate's Response and Action
Experts suggested the global item in the PCQ section to be rephrased as the existing sentence is double-barrelled.	The global item in the PCQ section, reading "Overall, I feel optimistic, hopeful, resilient, and I am self-confident" was replaced with "Overall, I possess psychological resources that facilitates goal achievement".
Experts suggested the global-item in the TOT-DC section to be rephrased as the existing sentence is double-barrelled. Furthermore, experts commented that the global-item sentence is inadequate to reflect the transfer of digital competencies to work.	The global-item in the TOT-DC section "Overall, I actively transfer knowledge, skills, and favourable attitude to my workplace" was replaced with "Overall, training encouraged me to be digitally competent at work".
Experts suggested the global item in the OCB section to be rephrased as the existing sentence is double-barrelled.	The global-item in the TOT-DC section, "Overall, I perceive myself committed to participate in organisational aspects, willing to help others, perform extra-role, proactive in preventing problems whilst forwarding goals, and exhibits sportsmanship" was replaced with "Overall, I proactively engage in extra-role behaviour".
Experts suggested the removal of the question "Please indicate your years of experience as an employee in your sector" as it can be reflected through position level in the demographics section.	The question: "Please indicate your years of experience as an employee in your sector" was removed as a similar question asking for the respondent's position level was included in the demographics section. In addition, a question requiring respondents to indicate their respective economic sectors was inserted.
Experts were concerned about the distribution of demographical questions throughout the survey form, which was initially intended to create temporal separation. The experts suggested that the demographical questions should be compiled together and placed under the same section.	All the demographical questions were integrated into a single section and placed before the section on OCB.

Subsequently, this study adopted a cognitive interview approach to pre-testing. Specifically, the protocol method in cognitive interviewing was adopted (Hunt, Sparkman, and Wilcox 1982). Five respondents were involved in this stage, as recommended by (Willis 2005). During

the pre-test, the respondents were encouraged to express their thoughts while filling in the questionnaire. Based on the feedback from the respondents, the following changes were made to the survey:

Table 3: Pre-Test Respondent's Feedback and Candidate's Response

Pre-Test Respondent's Opinion	Candidate's Response and Action
Respondents raised the concern that some people may not be aware that the trainings which they have attended are related to Industrial Revolution 4.0.	An additional question which requires respondents to specify the area of training was added to the first section of the questionnaire. This will give respondents an idea besides helping the research candidate to screen through completed survey forms, and subsequently decide on the inclusion or exclusion of a response from the final sample.

In the second round of pre-testing involving another five new respondents, there were no further issues raised and the respondents managed to complete the survey within 10 to 15 minutes. All ten pre-test respondents were advised to refrain from participating in the survey, even as they are being approached. Similarly, all ten responses were excluded from the final sample.

3.5.3 Format of Final Survey Questionnaire

The final instrument consists of six sections (See Appendix A). The Participant's Information Sheet formed the first section of the instrument. In this section, details on the research project, the candidate, and the candidate's thesis committee were first introduced. Participants were given assurance of confidentiality, informed about their voluntary participation and their rights to withdraw from the study. These measures were taken as a procedural remedy to mitigate the possibility of common method variance (Tehseen, Ramayah, and Sajilan 2017). Other information provided in the participant's information sheet include the reasons of choosing the participants for the study, the personnel with access to the information, how the participants may obtain results of the research if they are interested in it, the consent process, as well as directions for the completion of the instrument. Participants were also advised that the scale ratings differ from section to section. A consent form was found in the second section where participants may grant their implied consent.

Creswell and Guetterman (2019, 143) expressed concerns with sampling such as, "the researcher forgoes knowing exactly what individuals are in the sample" when pursuing snowball sampling. Therefore, the third section of the final instrument consisted of questions which help the candidate to determine if a respondent has been trained in Industrial Revolution

4.0 areas, whether a respondent is classified as a youth, if respondent is working in Sarawak, the duration after the individual has completed the training and the economic sector which the respondent is serving. During the pre-testing stage, several respondents were not aware that they have undergone Industrial Revolution 4.0 training despite being referred by their respective human resources personnel. Therefore, the second question on the nature of training which a respondent has attended may help the respondents and researcher determine if they qualify as “Industrial Revolution 4.0 trainees”.

The fourth section of the final instrument comprises of three survey instruments, namely, the Psychological Capital Questionnaire (PCQ), Utrecht Work Engagement Scale-9 (UWES-9), and the TOT-DC scale. The sixth section of the final instrument is the Organisational Citizenship Behaviour 8-Item Scale. Note that a global single item was included in every instrument to facilitate redundancy analysis. A summary of the number of items of each instrument, their scales, and sample items are tabulated as follows:

The candidate has deliberately inserted a section in between the fourth and sixth section to capture personal demographic information, which covers the gender, education attainment level, the nature of their respective employing organisations, and finally indicate whether they are working at their organisation’s headquarters or branch. Other demographic attributes aimed to capture fresh perspectives and directions for future analysis. The rationale of inserting the demographics section in between the instruments was to create temporal separation, a procedural remedy that may reduce common method variance (Podsakoff et al. 2003; Tehseen, Ramayah, and Sajilan 2017).

Table 4: List of Survey Instruments

Name of Instrument	Number of Items	Scale	Sample Items
<p>Psychological Capital Questionnaire (PCQ)</p>	<p>25</p>	<p>1 Strongly Disagree</p>	<p>“I feel confident analysing a long-term problem to find a solution”.</p> <p>“At the present time, I am energetically pursuing my work goals”.</p> <p>“In this job, things never work out the way I want them to”.</p>
		<p>2 Disagree</p>	
		<p>3 Somehow Disagree</p>	
		<p>4 Somehow Agree</p>	
		<p>5 Agree</p>	
		<p>6 Strongly Agree</p>	
<p>Utrecht Work Engagement Scale-9 (UWES-9)</p>	<p>10</p>	<p>0 Never</p>	<p>“At my work, I feel bursting with energy”.</p> <p>“My job inspires me”.</p> <p>“I get carried away when I’m working”.</p>
		<p>1 A Few Times a Year or Less</p>	
		<p>2 Once a Month or Less</p>	
		<p>3 A Few Times in a Month</p>	
		<p>4 Once a week</p>	
		<p>5 A few times a week</p>	
		<p>6 Everyday</p>	

Transfer of Training-Digital Competency Scale (TOT-DC)	13	1	Strongly Disagree	<p>“I use digital technology to improve work performance”.</p> <p>“I use digital technology to express my creativity”.</p> <p>“I am aware of ethical issues on the use of digital contents”.</p>
		2	Disagree	
		3	Neutral	
		4	Agree	
		5	Strongly Agree	
Organisational Citizenship Behaviour 8-Item Scale	9	1	Never	<p>“I willingly give my time to help others who have work-related problems”.</p> <p>“I give up time to help others who have work or non-work problems”.</p> <p>“I attend functions that are not required but that help the organisational image”.</p> <p>“I defend my organisation when other employees criticize it”.</p>
		2	Almost Never	
		3	Rarely	
		4	Sometimes	
		5	Often	
		6	Very Often	
		7	Always	

3.6 Data Analysis Technique

This section shall discuss the techniques utilised in the data analysis stage of this study.

3.6.1 Structural Equation Modelling and the Case for Partial Least Squares Structural Equation Modelling (PLS-SEM)

Structural Equation Modelling (SEM)- a fusion of “path modelling or multiple regression and factor analysis”, is highly regarded among social scientists due to its ability in theory testing and additive causal models (Haenlein and Kaplan 2004; Ramayah et al. 2018, 3). By allowing simultaneous testing of multiple regression models, more information on the loading and weight of each individual item can be extracted from the model (Ramayah et al. 2018). In other words, SEM provides higher predictive ability compared to multiple regression (Joseph F. Hair et al. 2017).

Both variations of SEM analysis, namely, Covariance-Based SEM (CB-SEM) and Partial Least Squares SEM (PLS-SEM) serve distinguished purposes. The primary use of CB-SEM is to test theories, whilst its primary concern is establishing goodness-of-fit between theoretical and empirical covariance matrix (Ramayah et al. 2018; Hair, Hult, et al. 2017). On the other hand, PLS-SEM is focused on maximising the explained variance of dependent variables- making it suitable for theory development, theory extension, or prediction (Hair et al. 2014; Ramayah et al. 2018). Other differences between CB-SEM and PLS-SEM are tabulated as follows:

Table 5: Comparison of CB-SEM and PLS-SEM

(Adopted from Hair, Ringle, and Sarstedt 2011)

Criteria	PLS-SEM	CB-SEM
Research Goals	<ul style="list-style-type: none"> I. Predicting key construct II. Identify key driver III. Exploratory research IV. Extension of existing structural theory. 	<ul style="list-style-type: none"> I. Theory testing II. Comparison of alternate theories
Measurement Model Specification	<ul style="list-style-type: none"> I. Used when structural model consists of formatively specified constructs. 	<ul style="list-style-type: none"> I. If error terms require specifications.
Structural Model	<ul style="list-style-type: none"> I. Complex structural model 	<ul style="list-style-type: none"> I. Non-recursive model
Data Characteristics and Algorithm	<ul style="list-style-type: none"> I. If CB-SEM cannot be met. II. Low sample size III. Non-normal data 	<ul style="list-style-type: none"> I. Data meets CB-SEM assumption
Model Evaluation	<ul style="list-style-type: none"> I. If latent variable is required in subsequent analysis. 	<ul style="list-style-type: none"> I. If global goodness of fit criterion is required. II. If test for measurement model invariance is required.

This study shall adopt PLS-SEM as the primary data analysis technique for several reasons. First, PLS-SEM exhibits favourable convergence behaviour and statistical power in circumstances where sample sizes are small (Henseler, Ringle, and Sarstedt 2014; Hair, Sarstedt, and Ringle 2019). Compared to CB-SEM, PLS-SEM possesses a high degree of statistical power, thus increasing the likelihood for PLS-SEM to identify the significance of relationship when they are present in the population (Hair et al. 2017). However, this study acknowledges that PLS-SEM, like other multivariate techniques, is incapable of utilising a poor sample to obtain valid model estimations (Hair, Ringle, and Sarstedt 2012; Hair, Sarstedt, and Ringle 2019). Secondly, PLS-SEM offers relatively higher flexibility in specifying models. In other words, PLS-SEM can be executed with formatively specified measurement model (Hair, Sarstedt, and Ringle 2019). As all constructs are examined as a higher-order construct

specified in a reflective-formative manner, PLS-SEM is preferred. Third, PLS-SEM is superior in mediation assessment due to its ability to remove measurement error and reduce bias (Hair, Sarstedt and Ringle 2019). This is particularly important to this study due to the inclusion of a mediating variable, TOT. Most importantly, this study aims at predicting theory. Therefore, PLS-SEM is seen superior over its CB-SEM counterpart to suit the purpose of this study.

3.6.2 Measurement Perspectives

The operationalisation of complex latent constructs have been a central question in social and behavioural sciences research (Ramayah et al. 2018). PLS-SEM is prominent for its ability to analyse both reflective and formative specified constructs (Hair et al. 2017). Two types of indicator measurement exist within the PLS-SEM domain, namely, reflective and formative constructs.

As misspecification of measurement model may result in inaccurate inferences such as parameter bias due to reversed causality, parameter bias due to item purification, and effect on fit statistics (Jarvis, MacKenzie, and Podsakoff 2003; Ramayah et al. 2018, 12), care must be exercised when determining measurement perspectives that exist in a model (Jarvis, MacKenzie, and Podsakoff 2003).

The causal arrows of a reflective construct point from the latent variable to its measured indicators, whereas the causal arrows of a formative construct point from the observed indicators to the latent variable (Ramayah et al. 2018). The main distinction between both specifications lies in the ability to retain the meaning of the construct upon removal of indicators. Generally, the removal of any indicators in a reflective construct will not alter the meaning of the latent variable (Haenlein and Kaplan 2004). Conversely, the removal of any indicator from a formatively specified construct will affect the validity of the latent variable (Ramayah et al. 2018).

From an empirical perspective, indicators of reflective constructs are highly correlated as they share the same latent variable whereas formative constructs oversee any pattern of inter-correlation (Diamantopoulos and Siguaw 2006). Besides, the measurement model ought to be reflective if items share similar signs and significant relationship with other constructs. Otherwise, a formative measurement model is opted (Diamantopoulos and Siguaw 2006; Ramayah et al. 2018).

3.6.3 Hierarchical Component Modelling (HCM)- Reflective-Formative Perspective

Over the years, social science researchers are increasingly inclined towards using hierarchical component models (HCMs) in PLS-SEM studies due to theoretical complexities and proliferation of cause-effect models (Ringle, Sarstedt, and Straub 2012). The use of HCMs measure constructs at a “higher level of abstraction”, promotes parsimony of path models, and increases the “bandwidth of content covered by constructs” (Johnson, Rosen, and Chang 2011; Hair et al. 2018, 38). HCMs involve simultaneous mapping of lower-order constructs (LOCs) and a higher-order constructs (HOC) (Hair et al. 2018). Lower-order constructs are also known as first-order constructs, whereas the higher-order construct is generally known as a second-order construct.

There are four types of HCMs, namely, reflective-reflective perspective, reflective-formative perspective, formative-reflective perspective, and formative-formative perspective (Hair et al. 2018).

Also known as a hierarchical common factor model, the reflective-reflective HCM oversees a reflective relationship between the first order and second order constructs where all components are measured reflectively (Hair et al. 2018). The higher-order construct represents the cause which results in the high correlation among LOCs (Jarvis, MacKenzie, and Podsakoff 2003). The reflective-reflective HCM is criticized due to its unidimensional nature, whereby the LOCs and its indicators are interchangeable (Lee and Cadogan 2013).

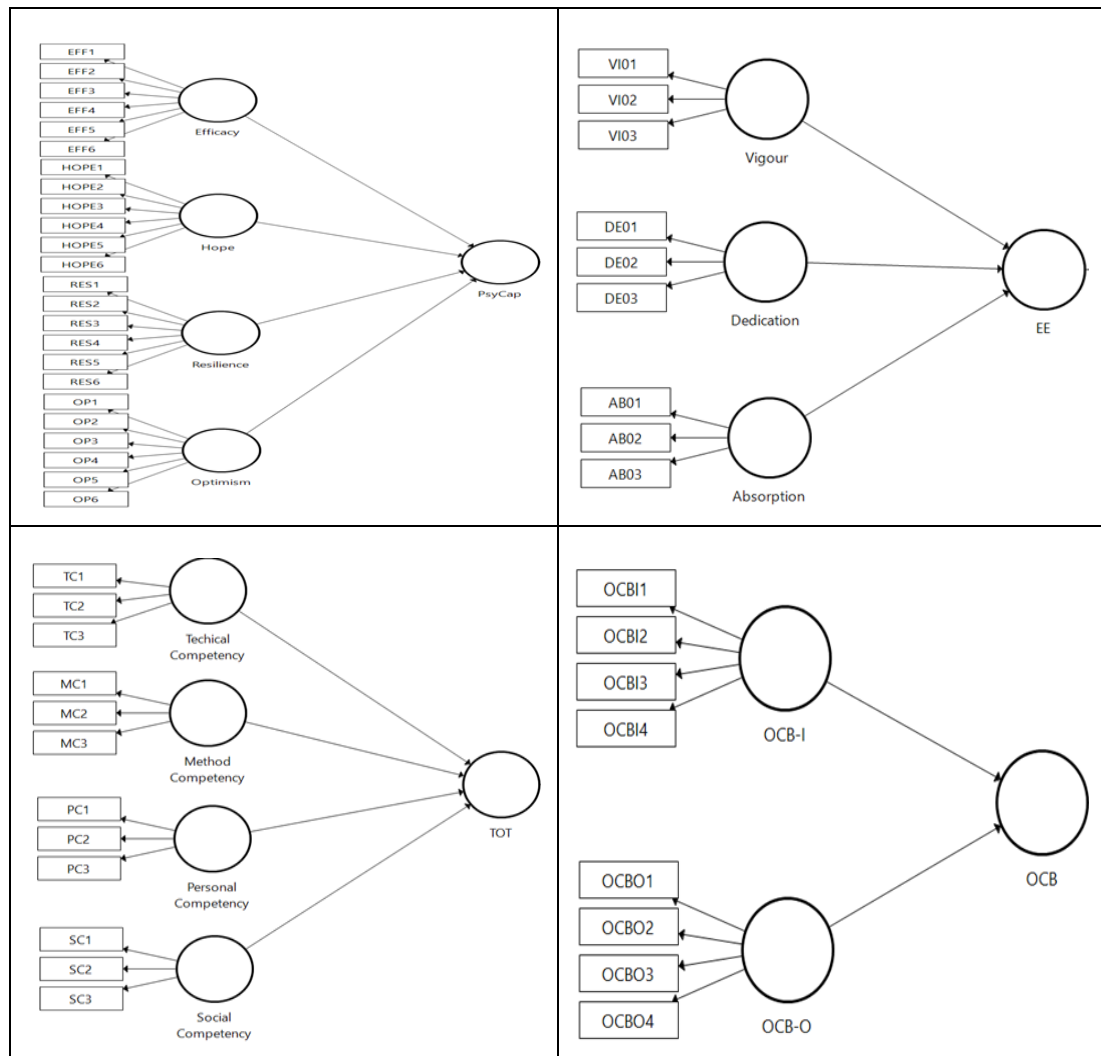
In reflective-formative HCMs, specific LOCs may not share a common cause but contributes to the HOC (Hair et al. 2018). According to Barroso and Picón (2012, 532) who included a reflective-formative HCM in their model, “a modification in one dimension do not imply modification in another”. In other words, LOCs do not necessarily covary. Instead, each dimension can vary independent of others (Hair et al. 2018, 45). The HOC fully mediates the relationship between LOCs with endogenous variables in a PLS path model (Hair et al. 2018, 45).

The third perspective of HCMs are rarely found in empirical research (Jarvis, MacKenzie, and Podsakoff 2003). Yet, formative-reflective HCMs “include a more general HOC that explains the formatively measured LOCs as the HOC represents part of the LOCs (Hair et al. 2018, 46). The use of several formatively measured LOCs permits a wider coverage on the construct’s domain, of which otherwise, insufficient in circumstances where stand-alone LOCs are concerned (Becker et al., 2012).

The final category of HCM is the formative-formative perspective which is “useful to structure a complex formative construct with many indicators into several sub-constructs” (Hair et al. 2018, 46). This pattern of HCM consists of different dimensions which reflects the overall domain. However, the different facets of the overall domain may not correlate with each other (Jarvis, MacKenzie, and Podsakoff 2003).

In this study, all the constructs under study shall assume a reflective-formative specification.

Table 6: Specification of Constructs' Measurement Model



3.6.4 Evaluating Second Order Constructs using the Disjoint Two-Stage Approach

Ringle, Sarstedt, and Straub (2012) suggested the utilisation of the two-stage approach to overcome limitations in assessing reflective-formative construct as a result of using the repeated indicators approach. In circumstances where the number of indicators is unequal, two-stage approach should be utilised to evaluate hierarchical component models. Moreover,

the two-stage approach provides a better estimation and increases the parsimony of a model in a higher-level analysis with the omission of the lower-order constructs (Becker et al., 2012).

As the name of the approach suggests, two stages are involved in assessing second-order constructs. In the first stage, only lower-order components are considered in the path model. The lower-order constructs are directly connected to other constructs of which the higher-order construct is theoretically related to (Sarstedt et al. 2019). The latent variable scores are then extracted to enable execution of the second stage. Algorithm settings are particularly important in estimating higher-order constructs (Sarstedt et al. 2019). Therefore, Mode A, which concerns the correlation weights, is applied to reflectively specified measurement models; whereas Mode B, which emphasizes on regression weights is used for formatively specified models (Becker, Klein, and Wetzels 2012). The structural model will be examined based on stage two results, as suggested by Sarstedt et al. (2019).

Collinearity, significance, relevance of path coefficients and predictive relevance of indicator weights are assessed and performed prior to assessment of the structural model (Hair et al. 2018).

3.6.5 Assessment of the Measurement Model

This section outlines the key assessments for both reflective and formative models, their respective criterion, and the acceptable value range.

The first step in reflective measurement model assessment is to assess the indicator's reliability. Loadings exceeding the threshold value of 0.708 are deemed satisfactory for inclusion as the construct explains more than fifty percent of the indicator's variance, thus, granting satisfactory item reliability (Hair et al. 2019, 8).

Next, composite reliability is examined to determine the internal consistency reliability of a construct (Hair, Ringle, and Sarstedt 2011; Hair et al. 2019, 158). Composite reliability values generally range between 0 to 1. A composite reliability value between 0.7 to 0.9 is deemed satisfactory (Hair et al. 2012; Hair et al. 2019); whereas values exceeding 0.9 may indicate redundancies (Hair et al. 2019).

The third assessment in assessing a reflective measurement model concerns the convergent validity of each construct in the form of Average Variance Extracted (AVE). In other words, the extent to which a construct converges to explain item variance is assessed (Hair et al. 2019, 9). Congruent with the acceptance criteria of indicator reliability values, a construct which explains more than fifty percent of item variance is desired. In such manner, the acceptable range of values for AVE is above 0.50 (Hair et al. 2019).

Discriminant validity is assessed in the final step of the reflective measurement model. In discriminant validity, the extent to which a construct is empirically distinct from other constructs in a structural model is assessed (Hair et al. 2019, 9). Due to shortcomings of the Fornell-Larcker criterion under circumstances where indicator loadings on a construct differ slightly, this study adopts the recommendation of Henseler, Ringle, and Sarstedt (2015) to pursue the Heterotrait-Monotrait (HTMT) criterion to assess discriminant validity of the measurement model. Henseler, Ringle, and Sarstedt (2014) and Hair et al. (2019) suggested a threshold value of 0.85, of which values exceeding 0.85 indicate discriminant validity issues.

In formative measurement model assessment, convergent validity, indicator collinearity, statistical significance, and relevance of indicator weights are examined (Hair et al. 2017).

Convergent validity in formatively specified constructs are subjected to redundancy analysis. The procedure examines “the correlation of the construct with an alternative measure of the same concept” (Hair et al. 2019, 9). Cheah et al. (2018) suggested the use of a single global item that reflects the construct in conducting redundancy analysis. The recommended correlation value between the formative construct and its global item is 0.70 and above (Hair et al. 2017 ; Hair et al. 2019).

The second step in assessing formative measurement model is the evaluation of formative indicator collinearity, of which Variance Inflation Factor (VIF) is placed under scrutiny. Ideally, VIF values should not exceed or equal to 3 (Hair et al. 2019).

The final step involves the assessment of indicator weights’ statistical significance and relevance (Hair et al. 2019, 10). According to Hair et al. (2017), indicators with a nonsignificant weight should be eliminated if the loading is also not significant. A low but significant loading of 0.50 and below suggests that one should consider deleting the indicator, unless there is strong support for its inclusion on the grounds of measurement theory.

3.6.6 Assessment of the Structural Model

Five steps are involved in assessment of the structural model in PLS-SEM, namely, assessment of structural model for collinearity issues, significance and relevance of the relationships within the structural model, coefficient of determination (R^2), effect size (f^2), and blindfolding-based Cross-Validated Redundancy Measure Using PLSpredict (Q^2).

The assessment of structural model for collinearity issues is important to address lateral collinearity issues (Ramayah et al. 2018). Lateral collinearity issue, or known as predictive-criterion collinearity poses a threat of misleading findings as it obscures strong causal effect in the model (Kock and Lynn 2012). Lateral collinearity issues in the structural model are

detected through VIF values, whereby a VIF value of 5 and above indicates potential collinearity problems (Hair, Ringle, and Sarstedt 2011). On the other hand, Diamantopoulos and Siguaw (2006) suggested a relatively stringent criteria, where VIF value exceeding 3.3 signifies lateral collinearity issues.

In determining the coefficient of determination, R^2 , the model's predictive accuracy is obtained. The coefficient is also perceived as the "combined effect of exogenous variables on endogenous variables" (Ramayah et al. 2018, 145). The value R^2 may range anywhere between 0 to 1, where higher values indicate greater explanatory power (Hair et al. 2019). According to Hair et al. (2017), R^2 values of 0.75, 0.50, and 0.25 represent substantial, moderate, and weak effect sizes.

The third step in structural model assessment is to assess the level of effect size, f^2 , which indicates "the relative impact of a predictor construct on an endogenous construct" (Ramayah et al. 2018, 146). The effect size is calculated based on Cohen's (1988) formula:

$$f^2 = \frac{R^2 \text{ included} - R^2 \text{ excluded}}{1 - R^2 \text{ included}}$$

The formula reflects the degree to which an exogenous construct contributes to an endogenous construct (Ramayah et al. 2018). In other words, a higher f^2 value indicates a stronger degree to which an exogenous construct contributes to the explanation of an endogenous construct. The effect sizes with values of 0.35, 0.15, and 0.02 are interpreted as large, medium, and small respectively.

Acknowledging the limitations of the conventional metrics used to assess predictive validity in PLS models, namely, Q^2 and q^2 in providing highly interpretable results (Shmueli et al. 2016) due to four reasons, namely, "(1) Q^2 combines internal consistency with predictive accuracy, (2) its imputation fails to fully capture type of heterogeneity associates with true out-of-sample prediction, (3) inability to compute case-wise predictions nor prediction intervals for new cases, and (4) is strenuous to evaluate in contextual terms (Ramayah et al. 2018, 175); PLSpredict is deployed in this study. In support of the mentioned criticism, Sarstedt, Ringle, and Hair (2017, 21) asserted that Q^2 is only partially considered as a measure of out-of-sample prediction. Therefore, to reinforce the assessment on predictive validity on the model, PLSpredict, a holdout-sample-based procedure that produces case-level predictions on either item or construct level to enhance predictive model assessment is carried out in this study (Shmueli et al. 2016). This constitutes the fourth step in assessing the structural model which involves the blindfolding-based cross-validated redundancy measure using PLSpredict

blindfolding procedure to obtain predictive relevance, Q^2 (Shmueli et al. 2016; 2019; Hair et al. 2019).

To initiate the function, a 10-fold cross validation is determined and used over ten repetitions, as recommended by Witten, Frank, and Hall (2016) and Shmueli et al. (2019). At the item level, $Q^2_{predict}$ for all indicators are significantly above zero (see Table 17). Therefore, the path model has a smaller prediction error compared to the naïve benchmark of linear models (Shmueli et al. 2019). Shmueli et al. (2019) suggested an examination on RMSE, except in circumstances where the predictive error is highly unsymmetrical. To assess the pattern of distribution, the latent variable scores of endogenous constructs are loaded onto a web application on [http:// psychstat.org/kurtosis](http://psychstat.org/kurtosis). Symmetrical distribution of predictive error is said to exist if multivariate kurtosis score is contained within 20 (Cain, Zhang, and Yuan 2017). The rule of thumb states that if PLS-SEM yields lower predictive error than linear models for a majority of indicators, the model is said to possess medium predictive power (Shmueli et al. 2019).

Lastly, the significance and relevance of path relationships are tested. As a non-parametric analysis technique, PLS-SEM does not account for distributional assumptions of data (Ramayah et al. 2018). While this appears as an advantage, particularly in social sciences with high reliance on non-normal data, the potential inflation or deflation of t-values may result in Type 1 error (Ramayah et al. 2018 ; Hair et al. 2019). Therefore, bootstrapping procedure is recommended to generate approximate t-values for significant testing of the structural model (Wong 2013). The path's coefficients significance typically falls within the range of -1 to $+1$ where values close to $+1$ indicate a strong positive relationship and vice-versa (Hair et al. 2019). It is also suggested that path's coefficients "should be at least at the 0.05 level of significance" (Hair et al. 2017). In exact, the critical values for significance levels $\alpha = 0.01$, $\alpha = 0.05$, and $\alpha = 0.10$ in two-tailed tests are 2.58, 1.96, and 1.645 respectively; while in one-tailed tests, the critical values are 2.33, 1.645, and 1.28 respectively (Ramayah et al. 2018).

3.6.7 Mediation Analysis

Mediation analysis has garnered widespread interest among scholars in the organisational psychology and organisational behaviour field (Holland, Shore, and Cortina 2017). This is attributed to a mediator's ability to specify how, or the underlying mechanism that results in a phenomenon (Memon et al. 2018; Ramayah et al. 2018).

Contrary to Baron and Kenny's (1986) method, which demanded for a causal procedure in mediation analysis, Hayes and Rockwood (2016) asserted that the focus in mediation analysis is the indirect effect. The current trend in mediation analysis is inclined towards bootstrapping

the indirect effect (Preacher and Hayes 2008; Ramayah et al. 2018). According to Hayes (2009), Zhao, Lynch, and Chen (2010), as well as Memon et al. (2018), bias-corrected bootstrapping is a powerful and rigorous method for testing mediation due to its ability to correct biases in confidence interval. In circumstances where t-value exceeds the critical value for significance level $\alpha = 0.05$, 1.96, along with p-value below 0.05, a mediation effect is deemed existent (Ramayah et al. 2018). In addition, the 95% bootstrapped confidence interval bias can be determined using the following formulae:

$$\text{Lower Limit} = a * b - z(SE), \text{ where } z, \text{ for } 0.05 \text{ level is } 1.96$$

$$\text{Upper Limit} = a * b + z(SE), \text{ where } z, \text{ for } 0.05 \text{ level is } 1.96$$

Regardless of the presence of direct effect, mediation is said to exist when indirect effect is supported (Aguinis, Edwards, and Bradley 2017)

According to Zhao, Lynch, and Chen (2010), five typologies on mediation and non-mediation exist. These typologies are namely, complementary mediation, competitive mediation, indirect-only mediation, direct-only non-mediation, and no-effect non-mediation. These categories of mediation and non-mediation are adopted to assess mediation in this study. Nitzl, Roldán, and Cepeda-Carrion (2017) further introduced full mediation, partial mediation and its various forms, such as complementary partial mediation, competitive partial mediation, as well as non-mediation with either direct-only or no-effect mediation. Under circumstances where more than one mediator exists in a single model, the mentioned categorisation remains relevant and applicable (Nitzl, Roldán, and Cepeda-Carrion 2017).

3.7 Ethical Considerations

The research candidate has undergone Research Integrity Training (RIT) on the university's student learning portal, Blackboard and obtained a 'Pass'. Given the involvement of human participants in this study, conducts in this study shall strictly adhere to the National Statement on Ethical Research. The ethics application was reviewed by the Curtin University Human Research Ethics Committee (HREC) and granted approval on 27 August 2019 with the approval number HRE2019-0571 (see Appendix 3B). As declared in the ethics application, implied consent will be obtained from the participants, and participants will not be exposed to any form of pressure or coercion to participate in this research. No personal information will be collected from the participants and their responses will remain confidential.

CHAPTER FOUR: RESULTS

This chapter begins by discussing the data preparation process, followed by response rates, descriptive statistics on the respondents and instrument items, normality of data, and statistical measures to identify common method variance. Further on, results on the measurement and structural model assessment, hypotheses testing, as well as mediation analysis are presented.

4.1 Data Preparation

The candidate commenced the data preparation process by data screening.

Data obtained through paper-based survey forms were manually screened for incomplete responses. To ensure that only qualified respondents are selected, the candidate included filter questions to the three criteria set, namely, (1) undergone Industrial Revolution 4.0 training, (2) a youth aged between 15-39, and (3) works in Sarawak.

While the earlier version of physical questionnaire specifically instructed the respondent to hand in the form if any of the questions yield “no” as an answer, the candidate realized that several respondents at the pre-testing stage were not aware that their KSA-set are Industrial Revolution 4.0 related. By instructing the respondent to hand in the questionnaire if their answer to the first filter question is “no” may disqualify the respondent prematurely.

Therefore, the candidate requested for their area of training (after the first filter question) to determine if they qualify for the study. If any of the respondents were to report a different area, they may inform the candidate under the ‘Others’ option and specify their area of training undergone. Manual screening is done by the candidate to determine if a response should be included in the final data pool.

Secondly, the candidate acknowledged that the age group of respondents may be of concern since instructions were not put in place to stop taking the survey. However, manual screening had been carried out to identify if any of them answers “no”. The respondents were asked to report their age across a span of 6 categories, as the candidate reserved for the possibility of a multi-group analysis that should be almost equal size of respondents for each category.

Lastly, manual screening equally applies to determine whether the respondent works in Sarawak, on top of targeting organisations in Sarawak and administering the physical survey forms in person. Their physical presence before the candidate is deemed as proof that they belong to the Sarawakian workforce.

On the other hand, responses were automatically screened using features offered by SurveyMonkey.

Incomplete responses were disqualified from the final dataset. Furthermore, the candidate carried out manual screening on the survey responses obtained to ensure that the final dataset consisted only of responses from qualified respondents that (1) have undergone Industrial Revolution 4.0 training, (2) are youth aged between 15-39 years, and (3) work in Sarawak.

The complete dataset was then coded according to a codebook prepared by the candidate. Subsequently, the complete dataset was loaded onto the Statistical Package for the Social Sciences (SPSS) for descriptive analysis.

4.1.1 Response Rate

The data collection period spanned over a period of five months, from September 2019 to January 2020. A mixture of paper-based and web-based survey forms were disseminated throughout the mentioned months. Recruitment emails containing the uniform resource locator (URL) were disseminated to potential respondents with assistance from industrial members and the University's alumni network. The candidate was unable to track the number of recipients nor access the respondents' contacts due to PDPA restrictions. Therefore, the candidate requested for reminders to be sent to the potential respondents. By the end of the data collection period, the web-based survey form gathered a total of 95 responses, of which only 42, equivalent to 44.21% were complete. Such phenomenon confirms Evans and Mathur's (2018) suggestion that web-based surveys normally yield low completion rates.

Among 300 physical survey forms distributes, only 209 complete responses were obtained, yielding a relatively higher response rate of 69.7%. This aligns with Creswell and Guetterman's (2019) suggestion that respondents feel more obligated to complete researcher-administered survey and thus, leading to higher response rates. The combination yielded a total of 251 responses, therefore, surpassed the required minimum sample size of 160, as suggested by (Kock 2018). This study adopted Ramayah et al. (2018) suggestion on the use of G*Power post hoc analysis to confirm whether a sample size of 251 is sufficient to achieve a statistical power of 80%, as recommended by Cohen (1988) and Cohen (1992), as well as an effect size of 0.15. With three predictors and a significance level of 0.05, the analysis suggested that a statistical power of 99.98% was achieved (see Figure 4).

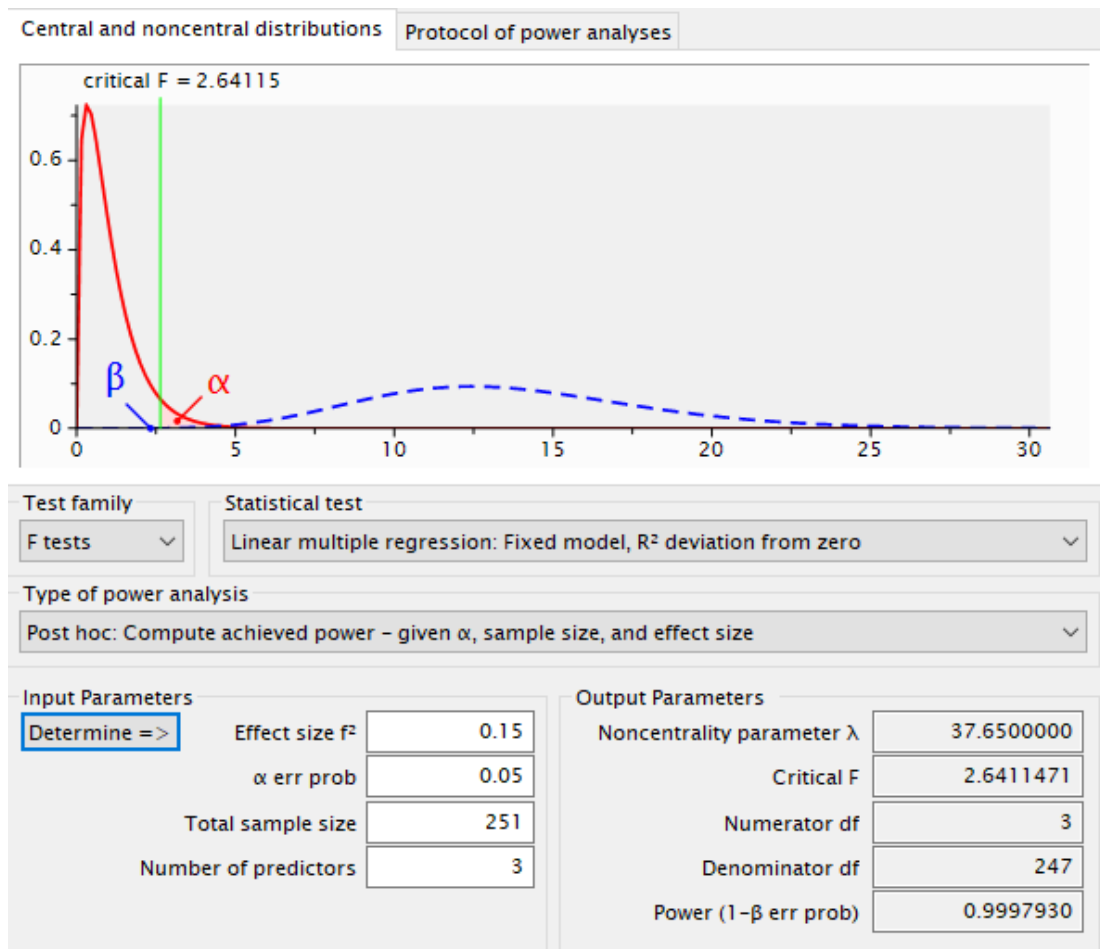


Figure 4: Post Hoc Analysis Computed using G*Power

4.1.2 Data Normality

According to Cain, Zhang, and Yuan (2017), identifying the skewness and kurtosis of data prior to determining the method of analysis is crucial to mitigate the occurrence of Type I error in t-tests and factor analysis. In other words, skewness and kurtosis are “the most important indicators of the extent which non-normality affects the usual inferences in analysing variance” (Scheffé 1959, 333). By acknowledging the severity and type of non-normality, better-suited methods of analysis may be adopted to enhance the robustness of the study.

Hair et al. (2017, 61) associated skewness with the symmetric property of a variable’s distribution while kurtosis represents the magnitude of distribution in terms of its peak. Distributions which exceed +1 or goes beyond -1 are considered to have violated assumptions of normally-distributed data (Hair et al. 2017).

Cain, Zhang, and Yuan (2017, 1719) suggested the use of Mardia’s measure of multivariate skewness and kurtosis to compare the joint distribution of multiple variables against a multivariate normal distribution. Results were obtained by utilising a web application on <http://>

psychstat.org/kurtosis. Based on the results generated, both univariate and multivariate data exhibited non-normal distribution. The univariate skewness of the four constructs ranged across -0.452 to -1.158. The kurtosis values of PsyCap, EE, TOT, and OCB are 0.093, 0.995, -0.063, and -0.109 respectively.

In a similar manner, the multivariate skewness and kurtosis exceeded the ceiling value of 3.0 and 20.0 respectively, yielding values of 3.183 and 28.297 respectively. Given prevalent distribution issues, the use of PLS-SEM in this study is further supported (Hamdollah and Baghaei 2016; Garson 2016).

4.1.3 Procedural and Statistical Remedies to Common Method Variance

Defined as the systematic variance induced by measurement techniques (Doty and Glick 1998), Common Method Variance (CMV) presents possibilities of bias in empirical estimation of relationships among variables (Doty and Glick 1998; Jakobsen and Jensen 2015). Therefore, procedural remedies were taken to address potential issues with CMV.

Research participants tend to inflate their responses due to social desirability (Tehseen, Ramayah, and Sajilan 2017). This will result in CMV. Therefore, a cover page indicating confidentiality of personal information and responses made in the survey is attached. Respondents were also informed of voluntary participation, and therefore, they reserved rights to withdraw. The candidate briefed them regarding the purpose of the study, provided clear instructions, and reassured them that all responses will remain confidential.

One of the main sources of CMV arises from assessing both dependent and independent variables using the same respondents (Tehseen, Sajilan and Ramayah 2017). Due to social desirability cues, respondents may inflate their responses to enhance their image (Tehseen, Sajilan and Ramayah 2017). However, due to time and resources constraint, this study will seek to introduce temporal separation (Tehseen, Sajilan and Ramayah 2017) by inserting a section on demographics in between instruments measuring the independent and dependant variables. Upon completion of the questionnaires, the candidate will collect them immediately. Similar procedures have been taken in studies by Memon et al. (2017) and Salas-Vallina, Alegre, and Fernandez (2017). According to Tehseen, Sajilan and Ramayah (2017), item ambiguity may affect responses. Therefore, pre-testing was carried out as a form of procedural remedy to enhance the items' clarity.

Administering procedural remedies does not warrant complete elimination of CMV in research findings (Tehseen, Sajilan, and Ramayah 2017). Therefore, statistical remedy based on Kock's (2015) recommendation is deployed. According to Kock (2015), CMV in PLS-SEM studies

are reflected through Variance Inflation Factor (VIF) values. Kock (2015) and Hair et al. (2017) suggested that VIF values below 3.3 indicate that a model is free from CMV. In this study, the VIF values of all items are lower than the ceiling value of 3.3, suggesting that the model is unlikely threatened by CMV. Results are tabulated as follows:

Table 7: Variance Inflation Factor for PsyCap Indicators

Variance Inflation Factor (VIF) for PsyCap Indicators							
EE1	1.759	HOPE1	1.815	RES1	1.073	OP1	1.357
EE2	2.302	HOPE2	1.877	RES2	1.289	OP2	1.479
EE3	2.653	HOPE3	1.349	RES3	1.163	OP3	1.846
EE4	1.850	HOPE4	1.680	RES4	1.311	OP4	1.941
EE5	1.979	HOPE5	1.919	RES5	1.245	OP5	1.500
EE6	1.593	HOPE6	1.923	RES6	1.239	OP6	1.369

Table 8: Variance Inflation Factor for EE Indicators

Variance Inflation Factor (VIF) for EE Indicators						
	AB01	1.691	DE01	2.249	VI01	1.699
	AB02	1.671	DE02	2.129	VI02	1.998
	AB03	1.753	DE03	2.020	VI03	1.462

Table 9: Variance Inflation Factor for TOT Indicators

Variance Inflation Factor (VIF) for TOT Indicators							
TC1	1.244	MC1	1.110	SC1	2.427	PC1	1.219
TC2	1.286	MC2	1.601	SC2	2.292	PC2	1.648
TC3	1.132	MC3	1.637	SC3	1.696	PC3	1.626

Table 10: Variance Inflation Factor for OCB Indicators

Variance Inflation Factor (VIF) for OCB Indicators							
OCBI1	2.050	OCBI2	1.308	OCBI3	1.850	OCBI4	2.324
OCBO1	1.630	OCBO2	1.706	OCBO3	2.343	OCBO4	2.246

4.2 Descriptive Statistics

Descriptive statistics in this section is generated using IBM SPSS software.

4.2.1 Demographical Profile of Respondents

Youth aged between 30-34 years are most prevalent among the respondents of this study, followed by those aged 25-29, 35-39, 20-24, and 18-19 respectively. Male and female comprise 50.6% and 48.6% of the respondents. Most respondents possess a bachelor's degree (71.7%), followed by those who possess a diploma or its equivalent, STPM (13.9%). 55.8% of the respondents hold executive roles, while the composition of other position holders are entry level employees (21.5%), manager (13.9%), owner (6.0%), and senior manager (2.8%). The economic sector of which the sampled youth served is dominated by the oil and gas sector (25.9%), followed by manufacturing (18.3%) and financial services (14.3%). Majority of the respondents served privately-owned organisations (92.8%), while a mere 7.2% of respondents were government workers. The demographical profiles of respondents are tabulated as follows:

Table 11: Demographical Profile of Respondents (Age)

Characteristic	Description	Frequency (N)	Percentage (%)
Age	18-19	2	0.8
	20-24	46	18.3
	25-29	72	28.7
	30-34	76	30.3
	35-39	55	21.9

Table 12: Demographical Profile of Respondents (Gender)

Characteristic	Description	Frequency (N)	Percentage (%)
Gender	Male	127	50.6
	Female	122	48.6

Table 13: Demographical Profile of Respondents (Education Level)

Characteristic	Description	Frequency (N)	Percentage (%)
Education Level	SPM	16	6.0
	Diploma / STPM	35	13.9
	Bachelor's Degree	180	71.7
	Master's Degree	19	7.6
	Doctorate Degree	2	0.8

Table 14: Demographical Profile of Respondents (Position)

Characteristic	Description	Frequency (N)	Percentage (%)
Position	Entry Level	54	21.5
	Executive	140	55.8
	Manager	35	13.9
	Senior Manager	7	2.8
	Owner	15	6.0

Table 15: Demographical Profile of Respondents (Firm Ownership of Employing Organisation)

Characteristic	Description	Frequency (N)	Percentage (%)
Firm Ownership	Private	233	92.8
	Government	18	7.2

Table 16: Demographical Profile of Respondents (Unit of Employment)

Characteristic	Description	Frequency (N)	Percentage (%)
Unit	Headquarters	129	51.4
	Branch	122	48.6

Table 17: Demographical Profile of Respondents (Economic Sector)

Characteristic	Description	Frequency (N)	Percentage (%)
Economic Sector	Agriculture, Forestry and Fishing	14	5.6
	Electricity and Energy	14	5.6
	Manufacturing	46	18.3
	Oil and Gas	65	25.9
	Mining and Quarrying	1	0.4
	Financial Services	36	14.3
	Services (Excluding Financial Services)	8	3.2
	Information and Technology	21	8.4
	Construction	11	4.4
	Education and Training	18	7.2
	Administrative and Support	4	1.6
	Human Health	10	4.0
	Professional Activities	2	0.8
	Others	1	0.4

4.2.2 Respondents' Training Profile

The most prevalent training was technical and vocational in nature, accounting for 19.5% of the respondents, followed by system integration (11.2%), internet of things (8.8%), as well as big data analytics (8.8%). Majority of the respondents have completed their trainings over a year ago (39.4%). Other respondents reported to have completed their trainings within a year at the point of survey administration. The full profiles are tabulated as follows:

Table 18: Training Profile of Respondents

Characteristic	Description	Frequency (N)	Percentage (%)
Training Area	Internet of Things (IoT)	22	8.8
	Additive Manufacturing	13	5.2
	Big Data Analytics	22	8.8
	Advanced Materials	13	5.2
	Artificial Intelligence	6	2.4
	Augmented Reality	4	1.6
	Cloud Computing	9	3.6
	Autonomous Robots	3	1.2
	Simulation	19	7.6
	System Integration	28	11.2
	Vertical Integration	9	3.6
	Blockchain Business Model	11	4.4
	Cybersecurity	6	2.4
	Soft-Skills	23	9.2
	Technical and Vocational Education and Training (TVET)	49	19.5
Others	14	5.6	
Months since Completion	Three months or less	40	15.9
	Four to six months	24	9.6
	Seven to nine months	50	19.9
	Ten to twelve months	38	15.1
	More than a year	99	39.4

4.2.3 Instrument Item

The minimum score, maximum score, mean and standard deviation of each indicator, according to their constructs are tabulated from table 19 to 22:

Table 19: Descriptive Statistics of PsyCap Indicators

Dimension	Indicator	Min	Max	Mean	Standard Deviation	Skewness	Excess Kurtosis
Efficacy	EFF1	2	6	4.797	0.876	-0.092	-0.73
	EFF2	2	6	4.681	0.929	-0.254	-0.64
	EFF3	3	6	4.729	0.918	-0.15	-0.863
	EFF4	2	6	5.112	0.890	-0.767	-0.037
	EFF5	1	6	4.657	1.101	-0.674	0.442
	EFF6	2	6	4.968	0.931	-0.77	0.231
Hope	HOPE1	2	6	4.944	0.891	-0.468	-0.263
	HOPE2	3	6	5.179	0.820	-0.518	-0.853
	HOPE3	3	6	5.159	0.772	-0.597	-0.191
	HOPE4	2	6	4.566	0.940	-0.076	-0.503
	HOPE5	2	6	4.980	0.890	-0.472	-0.318
	HOPE6	2	6	4.821	0.863	-0.281	-0.087
Resilience	RES1	1	6	4.554	1.129	-0.778	0.672
	RES2	2	6	4.988	0.872	-0.738	0.538
	RES3	1	6	4.781	0.951	-0.388	-0.152
	RES4	2	6	4.466	0.907	-0.189	-0.096
	RES5	1	6	4.725	0.910	-0.416	0.426
	RES6	1	6	4.697	1.069	-0.572	-0.055
Optimism	OP1	1	6	4.542	1.049	-0.705	0.847
	OP2	1	6	4.422	1.239	-0.618	-0.012
	OP3	2	6	5.036	0.894	-0.844	0.582
	OP4	2	6	5.100	0.853	-0.658	-0.095
	OP5	1	6	4.709	1.150	-0.916	0.888
	OP6	2	6	4.932	0.919	-0.454	-0.552
PsyCap Global	PCQG	2	6	4.677	0.671	0.009	-0.249

Table 20: Descriptive Statistics for EE Indicators

Dimension	Indicator	Min	Max	Mean	Standard Deviation	Skewness	Excess Kurtosis
Vigour	VI01	0	6	4.414	1.304	-0.792	0.259
	VI02	0	6	4.502	1.270	-0.832	0.206
	VI03	0	6	3.853	1.648	-0.585	-0.478
Dedication	DE01	0	6	4.717	1.267	-1.039	0.622
	DE02	0	6	4.478	1.446	-1.186	1.216
	DE03	0	6	4.884	1.382	-1.293	1.04
Absorption	AB01	0	6	4.394	1.411	-0.733	-0.257
	AB02	0	6	4.602	1.291	-1.015	0.833
	AB03	0	6	4.534	1.303	-1.063	1.078
EE Global	EEG	1	6	4.833	1.226	-1.127	0.831

Table 21: Descriptive Statistics for TOT Indicators

Dimension	Indicator	Min	Max	Mean	Standard Deviation	Skewness	Excess Kurtosis
Technical Competency	TC1	2	6	4.450	0.714	-0.912	-0.131
	TC2	2	5	4.004	0.825	-0.35	-0.691
	TC3	2	5	4.092	0.791	-0.408	-0.649
Methodological Competency	MC1	2	5	3.908	0.801	-0.254	-0.554
	MC2	1	5	4.060	0.809	-0.428	-0.346
	MC3	2	5	4.084	0.802	-0.48	-0.467
Social Competency	SC1	2	5	4.518	0.646	-1.094	0.464
	SC2	2	5	4.367	0.669	-0.667	-0.274
	SC3	2	5	4.418	0.653	-0.773	-0.07
Personal Competency	PC1	2	5	4.195	0.802	-0.462	-1.031
	PC2	3	5	4.526	0.645	-1.036	-0.052
	PC3	2	5	4.514	0.627	-1.028	0.462
TOT Global	TOTG	3	5	4.235	0.647	-0.272	-0.704

Table 22: Descriptive Statistics of OCB Indicators

Dimension	Indicator	Min	Max	Mean	Standard Deviation	Skewness	Excess Kurtosis
OCB (Individual)	OCBI1	1	7	5.530	1.231	-0.771	0.634
	OCBI2	1	7	4.462	1.673	-0.211	-0.713
	OCBI3	1	7	5.072	1.298	-0.134	-0.698
	OCBI4	2	7	5.590	1.165	-0.522	-0.378
OCB (Organisation)	OCBO1	1	7	4.076	1.737	0.034	-0.686
	OCBO2	1	7	4.833	1.586	-0.441	-0.251
	OCBO3	2	7	5.570	1.258	-0.629	-0.322
	OCBO4	2	7	5.940	1.231	-0.944	-0.179

According to Hair et al. (2014,54), given the ability of bootstrapping procedure to perform fairly robustly, standard deviation provides only limited guidance on determining the normality of data. Therefore, the emphasis should be placed on assessing skewness and kurtosis instead.

Skewness and kurtosis values with distributions exceeding +1 or go beyond -1 are considered to have violated assumptions of normally-distributed data (Hair et al. 2017). The skewness of items ranged between -1.031 to 1.216 whilst the excess kurtosis ranged between -1.293 and 0.034. This study acknowledges that several items exhibited deviation from normality. However, non-normality does not constitute serious concerns in PLS-SEM models due to the ability of bootstrapping procedure to perform relatively robustly (Hair et al. 2012).

4.3 Assessment of Reflective Measurement Model

At the first stage of assessment, a total of 53 indicators were included to assess the reflective measurement models of lower-order constructs (efficacy, resilience, hope, optimism, vigour, dedication, absorption, technical competency, methodological competency, social competency, personal competency, OCB-I and OCB-O).

Internal consistency, convergent validity, and discriminant validity of the reflective measurement models, namely, the first-order constructs of PsyCap, EE, and TOT, as well as the dependent variable, OCB are presented in the following sub-sections.

4.3.1 Internal Consistency and Convergent Validity of Psychological Capital

As mentioned in Chapter 3, this study opted for a reflective-formative specification to assess the measurement model of PsyCap. The four dimensions of PsyCap, otherwise known as its lower-order constructs, namely, efficacy, resilience, hope, and optimism, were first assessed. The outer loadings, composite reliability (CR) and average variance extracted (AVE) scores are tabulated in Table 23.

Loadings exceeding the threshold value of 0.708 are deemed satisfactory for inclusion as the construct explains more than fifty percent of the indicator's variance, thus, granting satisfactory item reliability (Hair et al. 2019). However, from the results, outer loadings of EFF6 (0.694), HOPE3 (0.602), HOPE4 (0.643), RES1 (0.320), RES3 (0.568), RES4 (0.688), RES5 (0.582), RES6 (0.653), OP1 (0.485), OP2 (0.385), and OP5 (0.451) fell below the threshold value of 0.708. Ramayah et al. (2018) suggested deletion of items with outer loadings lesser than 0.40.

RES1 (0.320) is first removed as it has the lowest outer loading among all indicators. The removal of RES1 improved CR of hope from 0.768 to 0.789, whilst the AVE increased from 0.368 to 0.430. To further enhance the AVE score of the said lower-order construct, RES3 (with an outer loading of 0.568) was dropped from the measurement model. Its AVE increased to 0.484, while the CR dropped by 0.01, resulting in a score of 0.789. Lastly, the removal of RES5 increased the AVE of the lower-order construct to 0.542, whilst its CR dropped to 0.780. Although RES4 and RES6, with outer loadings of 0.688 and 0.653 respectively did not meet the threshold level of 0.708, they were retained as sufficient CR and AVE values that were achieved. Furthermore, upon deletion of other indicators- the outer loadings of RES2, RES4, and RES6 significantly improved to 0.786, 0.721, and 0.699 respectively.

Next, OP2 (0.385) was dropped as its outer loading is below 0.40. Initially, the CR and AVE values are 0.814 and 0.437 respectively. Removal of the said indicator enhanced CR score by 0.12, resulting in a CR value of 0.826, besides increasing its AVE to 0.498. The subsequent removal of OP5 (0.451) improved the CR of the lower-order construct to 0.854, whilst the AVE score was increased to 0.595.

Indicators with loadings above 0.40 but do not exceed 0.708 may be retained if they achieve satisfactory levels of AVE (>0.50) and composite reliability (>0.70) (Hair et al. 2012). Therefore, no adjustments were made to the measurement model of efficacy and hope, as both lower-order constructs have achieved satisfactory levels of CR and AVE. After several adjustments, the lower-order constructs of PsyCap have achieved adequate internal consistency and convergent validity for subsequent analysis.

Table 23: Internal Consistency and Convergent Validity of PsyCap

Construct	Indicator	Loadings	CR	AVE
Efficacy	EFF1	0.755	0.904	0.612
	EFF2	0.816		
	EFF3	0.845		
	EFF4	0.789		
	EFF5	0.785		
	EFF6	0.694		
Hope	HOPE1	0.780	0.874	0.539
	HOPE2	0.808		
	HOPE3	0.602		
	HOPE4	0.643		
	HOPE5	0.809		
	HOPE6	0.737		
Resilience	RES1	0.320 (Dropped)	0.780	0.542
	RES2	0.786		
	RES3	0.568 (Dropped)		
	RES4	0.721		
	RES5	0.632 (Dropped)		
	RES6	0.699		
Optimism	OP1	0.659	0.854	0.596
	OP2	0.387 (Dropped)		
	OP3	0.825		
	OP4	0.843		
	OP5	0.454 (Dropped)		
	OP6	0.747		

4.3.2 Internal Consistency and Convergent Validity of Employee Engagement

The outer loadings, CR and AVE values of indicators of the lower-order constructs of EE, namely, vigour, dedication, and absorption are tabulated in Table 24. Based on the results, all the indicators exceeded the threshold value of 0.708, as suggested by Hair et al. (2017), Ramayah et al. (2018) and Hair et al. (2019). The CR values of 0.871, 0.912, and 0.881 suggested that the internal consistencies of the items are satisfactory (Hair et al. 2019). The AVE values of 0.693, 0.775, and 0.712 for vigour, dedication, and absorption also suggested adequate convergent validity.

Table 24: Internal Consistency and Convergent Validity of EE

Construct	Indicator	Loadings	CR	AVE
Vigour	VI01	0.803	0.871	0.693
	VI02	0.896		
	VI03	0.795		
Dedication	DE01	0.885	0.912	0.775
	DE02	0.873		
	DE03	0.883		
Absorption	AB01	0.853	0.881	0.712
	AB02	0.831		
	AB03	0.847		

4.3.3 Internal Consistency and Convergent Validity of Transfer of Training

The outer loadings, CR and AVE values of indicators of the lower-order constructs of TOT, namely, technical, methodological, social, and personal competencies are tabulated in Table 25. Based on the results, all the indicators exceeded the threshold value of 0.708, except TC3 (0.689) and MC1 (0.496).

According to Hulland (1999), loadings between 0.40 to 0.70 should only be removed if its removal increases the CR and AVE values. However, indicators with outer loadings above 0.40 but do not exceed 0.708 may be retained if they achieve satisfactory levels of AVE (>0.50) and composite reliability (>0.70) (Hair et al. 2012). Therefore, given that all CR and AVE of the lower order constructs are satisfactory, no indicators were removed from the measurement model.

Table 25: Internal Consistency and Convergent Validity of TOT

Construct	Indicator	Loadings	CR	AVE
Technical Competency	TC1	0.781	0.788	0.554
	TC2	0.756		
	TC3	0.693		
Methodological Competency	MC1	0.492	0.806	0.595
	MC2	0.885		
	MC3	0.872		
Social Competency	SC1	0.895	0.905	0.760
	SC2	0.906		
	SC3	0.810		
Personal Competency	PC1	0.757	0.839	0.635
	PC2	0.820		
	PC3	0.813		

4.3.4 Internal Consistency and Convergent Validity of Organisational Citizenship Behaviour

The dependent variable of this study, OCB, is measured reflectively. The results for the assessment of its measurement model is presented as follows:

Table 26: Internal Consistency and Convergent Validity of OCB

Construct	Indicator	Loadings	CR	AVE
OCBI	OCBI1	0.854	0.848	0.594
	OCBI2	0.454		
	OCBI3	0.834		
	OCBI4	0.865		
OCBO	OCBO1	0.669	0.856	0.600
	OCBO2	0.746		
	OCBO3	0.857		
	OCBO4	0.815		

Based on the results, the outer loading of an item, OCBI2 (0.463), failed to meet the threshold level of 0.708. Based on recommendations from Ramayah et al. (2018) and Hair et al. (2019), OCBI2 is retained for satisfactory values for CR and AVE have been achieved.

Similarly, no indicators were removed from OCBO despite OCBO1 (0.669) falling below the threshold level of 0.708. The retention was due to satisfactory CR and AVE values, as recommended by Ramayah et al. (2018) and Hair et al. (2019).

4.3.5 Discriminant Validity of Reflective Measurement Model

After internal consistencies and convergent validity of the measurement models have been established, discriminant validity must be assessed for construct validity. Generally, discriminant validity refers to a measure of the extent to which items of a construct are “empirically unique” and able to capture a phenomenon in a way that other constructs in a model cannot (Hair et al. 2012). In other words, discriminant validity assesses whether a measure correlates too-highly with “other measures from which it is supposed to differ” (Campbell and Fiske 1959, 548).

Given the importance of discriminant validity in confirming the precision of results that confirms a hypothesized structural path, and to ensure that results are free from statistical discrepancies (i.e.: caused by CMV), several criteria were introduced to establish discriminant validity. Traditionally, discriminant validity was examined using either Fornell-Larcker criterion or cross-loadings.

The Fornell-Larcker criterion suggests that a latent construct which accounts for more variance in its own indicators rather than other constructs in a model is said to have achieved discriminant validity (Fornell and Larcker 1981). In other words, the AVE of each construct is compared against the squared correlation of other constructs in the same model, and discriminant validity is established if AVE exceeds inter-construct correlation values (Henseler, Ringle, and Sarstedt 2015). Nevertheless, the Fornell-Larcker criterion is criticised for its inefficacy in assessing discriminant validity due to its low sensitivity rates (Rönkkö and Evermann 2013; Henseler et al. 2014; Henseler, Ringle, and Sarstedt 2015).

On the other hand, cross-loading, otherwise known as “item-level discriminant validity”, is a relatively lenient assessment for discriminant validity. Cross-loading often supports discriminant validity in cases where Fornell-Larcker criterion fails (Henseler, Ringle, and Sinkovics 2009). Gefen and Straub (2005, 92) suggested that discriminant validity is established if a measurement item correlates strongly with other theoretically related items and weakly with measurement items from other constructs. The said rule forms the basis of cross-loading. Similarly, cross-loading holds insufficient sensitivity to determine a lack of discriminant validity (Henseler, Ringle, and Sarstedt 2015).

In view of the inadequacies of traditional approaches to assess discriminant validity, Henseler, Ringle, and Sarstedt (2015) introduced the heterotrait-monotrait (HTMT) ratio that is built on the basis of the classical multitrait-multimethod (MTMM) matrix by Campbell and Fiske (1959). Generally, when the HTMT value is lesser than one, the true correlation between two constructs is likely to deviate from 1, indicating a difference between two constructs (Henseler,

Ringle, and Sarstedt 2015). HTMT can be assessed in two ways, either as a criterion, or a statistical test. The first method of assessing HTMT is by comparing it to a threshold value. Hair et al. (2019) suggested two threshold values: 0.85 ($HTMT_{0.85}$) or 0.90 ($HTMT_{0.90}$) for such purpose. The said threshold values were suggested by Kline (2011) and Gold, Malhotra, and Segars (2001) respectively. If HTMT ratio falls below the said threshold value, discriminant validity is said to be established. Based on the generated results, correlations between the lower-order constructs, namely, dedication and absorption, vigour and absorption, vigour and dedication, as well as hope and optimism, failed to contain within the threshold values (see Table 9).

The second method, a statistical test for HTMT, otherwise known as $HTMT_{inference}$ evinces the leveraging of bootstrapping procedure to construct confidence intervals for the HTMT (Henseler, Ringle, and Sarstedt 2015; Hair et al. 2019). Ramayah et al. (2018), in line with Franke and Sarstedt (2019), strongly recommended the use of inferential test as it generates relatively fewer false positives compared to the criterion method. The construction of confidence interval is meant to test the null hypothesis $H_0: HTMT \geq 1$ against the alternative hypotheses where $H_1: HTMT < 1$. In cases where the confidence intervals contain the value of one, a lack of discriminant validity is identified. Therefore, a complete bootstrapping procedure with 5000 re-samples was carried out. Apart from optimism-hope, hope-resilience and vigour-absorption, other bias-corrected confidence intervals do not contain value of 1. The results are presented in Table 27, which the brackets contain the 5% and 95% confidence intervals respectively.

Despite persisting problems with HTMT values, the candidate will not remove any indicators from the model as the constructs are theoretically related and measure the same construct. Therefore, the constructs will be merged to form a higher-order construct in the second stage of analysis, as suggested by Henseler, Ringle, and Sarstedt (2015). Apart from recommendations by Henseler, Ringle, and Sarstedt (2015), theoretical support is available that conceptualises PsyCap (Luthans and Youssef-Morgan 2017; Tan, Lew, and Sim 2018; Grover et al. 2018) and EE (Hoole and Bonnema 2015; Sinval et al. 2018) as a higher order construct.

Discriminant validity of the lower-order constructs of PsyCap, namely, hope, efficacy, optimism, and resilience have shown conflicting results in studies over the years and all four components have demonstrated an underlying link, suggesting that high correlations between the lower order constructs, as seen in this study, which is not surprising (Nolzen 2018). Similarly, lower order constructs of EE, namely vigour, dedication, and absorption are often

found to exhibit high correlations, therefore, specifying EE as a higher order construct is recommended (Bailey et al. 2017).

In this study, the HTMT ratio significantly decreased below 0.80 whilst bootstrapping results show that the confidence intervals at 5% and 95% (shown in brackets) do not contain the value of 1 upon merging the lower-order constructs to form higher-order constructs.

Table 27: HTMT Matrix with Confidence Intervals of 5% and 95% of Lower Order Constructs

	Absorption	Dedication	Efficacy	Hope	Method	OCBI	OCBO	Optimism	Personal	Resilience	Social	Technical	Vigour
Absorption													
Dedication	0.933 (0.865,0.985)												
Efficacy	0.571 (0.467,0.661)	0.500 (0.401,0.585)											
Hope	0.571 (0.458,0.664)	0.570 (0.470,0.654)	0.729 (0.645,0.803)										
Method	0.308 (0.182,0.428)	0.324 (0.194,0.454)	0.481 (0.356,0.593)	0.573 (0.449,0.684)									
OCBI	0.553 (0.428,0.664)	0.528 (0.409,0.631)	0.425 (0.315,0.519)	0.482 (0.359,0.567)	0.390 (0.259,0.509)								
OCBO	0.659 (0.561,0.742)	0.647 (0.552,0.720)	0.640 (0.545,0.722)	0.679 (0.588,0.758)	0.472 (0.343,0.593)	0.746 (0.653,0.824)							
Optimism	0.581 (0.455,0.687)	0.599 (0.475,0.701)	0.556 (0.414,0.673)	0.864 (0.772,0.927)	0.387 (0.250,0.525)	0.451 (0.338,0.543)	0.685 (0.584,0.767)						
Personal	0.495 (0.365,0.615)	0.354 (0.233,0.470)	0.502 (0.382,0.609)	0.588 (0.477,0.685)	0.710 (0.588,0.820)	0.476 (0.357,0.583)	0.496 (0.362,0.612)	0.501 (0.385,0.608)					
Resilience	0.593 (0.460,0.701)	0.512 (0.387,0.629)	0.757 (0.630,0.872)	0.943 (0.852,1.026)	0.497 (0.333,0.637)	0.437 (0.310,0.538)	0.671 (0.565,0.768)	1.013 (0.928,1.100)	0.504 (0.358,0.633)				
Social	0.304 (0.192,0.406)	0.327 (0.210,0.440)	0.345 (0.240,0.442)	0.529 (0.428,0.625)	0.695 (0.562,0.816)	0.326 (0.219,0.411)	0.408 (0.307,0.510)	0.442 (0.324,0.553)	0.658 (0.558,0.753)	0.501 (0.348,0.640)			
Technical	0.359 (0.234,0.476)	0.300 (0.166,0.415)	0.542 (0.415,0.658)	0.622 (0.503,0.732)	0.876 (0.754,1.001)	0.350 (0.205,0.486)	0.535 (0.386,0.671)	0.483 (0.341,0.626)	0.719 (0.600,0.831)	0.640 (0.503,0.774)	0.588 (0.443,0.715)		
Vigour	0.956 (0.889, 1.021)	0.935 (0.873,0.990)	0.595 (0.494,0.680)	0.617 (0.514,0.704)	0.313 (0.168,0.450)	0.516 (0.384,0.623)	0.683 (0.585,0.763)	0.612 (0.481,0.719)	0.398 (0.267,0.522)	0.506 (0.374,0.628)	0.253 (0.137,0.372)	0.300 (0.165,0.439)	

Table 28: HTMT Matrix at 95% Confidence Interval for Higher-Order Constructs

	EE	OCB	PsyCap	TOT
EE				
OCB	0.718 (0.625,0.798)			
PsyCap	0.661 (0.575,0.738)	0.745 (0.669,0.811)		
TOT	0.424 (0.313,0.530)	0.618 (0.505,0.719)	0.689 (0.584,0.780)	

4.4 Assessment of Formative Measurement Model

In the second stage of assessment, the latent variable scores of efficacy, resilience, hope, and optimism were used as indicators for the higher-order construct, PsyCap. Similarly, latent variable scores of vigour, dedication, and absorption- which are lower-order constructs of EE were used as indicators. The same procedure applies to TOT, where the latent variable scores of technical competency, methodological competency, social competency, and personal competency were used as indicators to the higher-order construct. Such recommendation was made in the works of Becker, Klein, and Wetzels (2012) and Sarstedt et al. (2019). Assessment of formative measurement models involves testing for convergent validity through redundancy analysis, collinearity through VIF values, as well as relevance of weights and statistical significance through bootstrapping procedure (Hair et al. 2019).

4.4.1 Redundancy Analysis for Convergent Validity

Convergent validity in formative measurement models refers to the “extent of correlation between a formatively measured construct and another conceptually-similar construct” (Hair et al. 2017; Cheah et al. 2018). In regards to the essence of convergent validity in formatively-measured models, redundancy analyses can be carried out (Chin 1998; Cheah et al. 2018). Hair et al. (2017, 112) suggested a single-item measurement, known as global single item which represents the same construct to serve the mentioned purpose.

Based on Cheah et al.’s (2018) recommendation, all global single items in this study were first derived from the theoretical definition of the latent constructs. The generation of the global single item of PsyCap hedges on its definition, such that, “PsyCap represents an individual’s motivated efforts and resilience to positively appraise circumstances and increase likelihood of success (Luthans, Youssef, and Avolio 2007, 550). Therefore, the global-single item was

given as: “Overall, I possess psychological resources that facilitates goal achievement”. On the other hand, EE is defined as mindful state of motivation focused on work (Schaufeli et al. 2002, 74; Schaufeli and Bakker 2010, 13; Bakker and Demerouti 2017, 275). Therefore, the global single item of EE is given as: “Overall, I am engaged in my job”. In a similar manner, the TOT construct, which concerns digital competencies was defined as transfer as a chain of choices made by trainees in “discarding, maintaining, applying, or modifying” work elements (Baldwin, Ford, and Blume 2017) which encompasses the areas of technical, methodological, social, and personal dimensions of competencies (Colbert, Yee, and George 2016; Alam et al. 2018; Armstrong et al. 2018). Therefore, the global single item of TOT is given as: “Overall, training encouraged me to be digitally competent at work”. In a similar way, the global single item of OCB was drawn from its definition as an extra-role and voluntary behaviour directed at other collectives of an organisation (Saks 2006; 2019). In addition, drawing on Bruning and Campion’s (2018, 507) definition of social expansion, whereby: “social behaviour refers to a phenomenon within the social domain of work and involves the distribution or contribution of resources to another collective member”. This study equates OCB as a form of social expansion, and therefore, equal emphasis was given in constructing the global single item. As such, the global single item of OCB is phrased: “I proactively engage in extra-role behaviour”.

Second, reliability assessment of the single items was carried out using the following formula, which Cheah et al. (2018) derived from Wanous, Reichers, and Hudy's (1997) single-item reliability measure:

$$r_{xx} = \frac{r_{xy}^2}{r_{yy}}$$

Whereby:

r_{xx} = Reliability of the single item estimate

r_{xy}^2 = Squared correlation between composite score of multi-items and global single item.

r_{yy} = Reliability of multi-item measure

Distinct from previous reliability measures in earlier sections of this chapter, the Cronbach’s alpha value was used as the reliability measure. The choice was made in accordance to Cheah et al.'s (2018) approach, where the authors stated the suitability of Cronbach’s alpha in assessing model-independent reliability. The squared correlation between composite score of

both multi-items and single items for the constructs of PsyCap, EE, TOT, and OCB are given as 0.590, 0.624, 0.599, and 0.637 respectively. The Cronbach's alphas for the mentioned constructs are 0.913, 0.921, 0.859, and 0.877 respectively. By incorporating the reported values into the formula, the estimated reliabilities of the global single items of PsyCap, EE, TOT, and OCB are 0.865, 0.834, 0.901, and 0.726 respectively. These scores are clearly supportive of the reliabilities of the single items as they exceeded Nunnally's (1978) recommendation of 0.70.

Next, the convergent validities of the single items were assessed using the square-root of the correlation (Christophersen and Konradt 2011; Cheah et al. 2018). All of the global single items for PsyCap, EE, TOT, and OCB exceeded the threshold value of 0.80 (scoring 0.889, 0.876, 0.880, and 0.893 respectively), and thus, it can be concluded that convergent validity was established.

Hair et al. (2017) and Cheah et al. (2018) congruently suggested that a path coefficient of 0.70 or higher must be achieved to conclude that a formative construct is able to explain at least 50% of its variance. The path coefficient between multi-item measure of PsyCap and its global single item is 0.768, whereas the path coefficient between multi-item measure of EE and its global single item yielded a value of 0.790. TOT, similarly, achieved satisfactory path coefficient of 0.774. OCB, on the other hand, yielded a path coefficient of 0.798. Therefore, it is concluded that convergent validity is established for all four formative measurement models.

4.4.2 Collinearity of Formative Indicators

As indicators in a formatively-measured model are not interchangeable, collinearity, otherwise known as high correlation between formatively-measured indicators are not expected (Ramayah et al. 2018). In addition, formative indicators are assumed to be free from error (Hair, Ringle, and Sarstedt 2011). According to Hair et al. (2017), Ramayah et al. (2018) and Hair et al. (2019), variance inflation factor (VIF) can be used to examine collinearity of formative indicators. Kock (2015) recommended the mentioned method to identify error stemming from CMV. Ideally, VIF values should be lower, close, or equal to 3 (Diamantopoulos and Siguaw 2006; Becker et al. 2015; Hair et al. 2019). Results indicated that all formative indicators have VIF values below 3, except for dedication, which has a VIF value of 3.087. However, VIF values below 5 are deemed acceptable despite suggesting potential collinearity issues (Hair, Ringle, and Sarstedt 2011; Hair et al. 2019). It is therefore concluded that there are no critical levels of collinearity in the measurement model. Full results on the VIF scores are tabulated in Table 29:

Table 29: Variance Inflation Factor of Formatively Measured Indicators

Higher-Order Construct	Lower-Order Construct	VIF Value
Psychological Capital	Efficacy	1.738
	Hope	2.276
	Resilience	2.708
	Optimism	2.343
Employee Engagement	Vigour	2.923
	Dedication	3.084
	Absorption	2.963
Transfer of Training	Technical Competency	1.569
	Methodological Competency	1.729
	Social Competency	1.572
	Personal Competency	1.555
Organisational Citizenship Behaviour	OCB-I	1.555
	OCB-O	1.555

4.4.3 Statistical Significance and Relevance of Formative Indicator Weights

According to Ramayah et al. (2018), outer weights are imperative to evaluate the contribution of a formative indicator. Outer weight is the outcome of multiple regression where the latent variable scores serve as dependent variables while the formative indicators serve as independent variables (Hair et al. 2017). To obtain the outer weights, a complete bootstrapping procedure, with 5000 resamples, two-tailed test, as well as significance level of 0.05 was carried out. Based on the results (see Table 30), all formative indicators established statistical significance where $p < 0.05$, except for resilience, whose p-value, 0.584, indicated non-significance.

Cenfetelli and Bassellier (2009) and Hair et al. (2019) stressed the importance of considering the absolute contribution of a formative indicator to the construct when dealing with non-significant indicator weights. Sharing a similar point of view, Ramayah et al. (2018) suggested that the absolute contribution of the formative indicator to the construct should be assessed. Generally, an indicator should be retained if (1) its outer loading is equal to or exceeds 0.50 and (2) t-value exceeds 1.96 (Hair et al. 2017; Ramayah et al. 2018; Hair et al. 2019). Therefore, resilience was retained as a formative indicator as its outer loading and t-value were 0.714 and 15.335 respectively. Both criteria have exceeded the minimum threshold value.

Table 30: Path Assessment of Formative Measurement Model and Decision on Retention of Indicators

	Outer Weight	Standard Deviation	t-value	p-value	97.5% Confidence Interval	Outer Loading	Standard Deviation	t-value	p-value	97.5% Confidence Interval	Decision
Absorption → EE	0.382	0.125	3.062	0.002	[0.140, 0.627]	0.922	0.033	28.195	0.000	[0.849, 0.973]	Retain
Dedication →EE	0.310	0.121	2.568	0.010	[0.077, 0.554]	0.910	0.033	27.401	0.000	[0.838, 0.966]	Retain
Efficacy →PsyCap	0.421	0.066	6.418	0.000	[0.286, 0.545]	0.827	0.036	22.963	0.000	[0.755, 0.893]	Retain
Hope →PsyCap	0.423	0.086	4.928	0.000	[0.247, 0.588]	0.911	0.024	37.394	0.000	[0.859, 0.952]	Retain
Method → TOT	0.240	0.109	2.203	0.028	[0.017, 0.440]	0.767	0.057	13.359	0.000	[0.647,0.865]	Retain
OCBI→ OCB	0.287	0.093	3.095	0.002	[0.108, 0.472]	0.766	0.058	13.229	0.000	[0.637, 0.868]	Retain
OCBO→ OCB	0.802	0.075	10.720	0.000	[0.637, 0.930]	0.973	0.019	51.068	0.000	[0.926, 0.996]	Retain
Optimism→ PsyCap	0.368	0.080	4.576	0.000	[0.206, 0.522]	0.822	0.040	20.454	0.000	[0.735,0.890]	Retain
Personal→ TOT	0.433	0.099	4.381	0.000	[0.222, 0.615]	0.837	0.048	17.506	0.000	[0.737,0.919]	Retain
Resilience→ PsyCap	-0.050	0.091	0.548	0.584	[-0.227, 0.126]	0.714	0.047	15.335	0.000	[0.618,0.799]	Retain
Social → TOT	0.273	0.102	2.689	0.007	[0.080, 0.480]	0.754	0.060	12.494	0.000	[0.631, 0.863]	Retain
Technical →TOT	0.321	0.105	3.054	0.002	[0.117, 0.532]	0.771	0.064	12.057	0.000	[0.645, 0.881]	Retain
Vigour → EE	0.397	0.115	3.453	0.001	[0.178, 0.624]	0.924	0.029	31.780	0.000	[0.863, 0.971]	Retain

4.5 Assessment of the Structural Model

The structural model was assessed against five criteria, namely, lateral collinearity, significance and relevance of structural model relationships, level of coefficient of determination (R^2), level of effect size (f^2), predictive relevance of an endogenous construct to the structural model (Q^2) as recommended by Ramayah et al. (2018) and Hair et al. (2019). In addition, the use of PLSpredict to predict out-of-sample predictive capacities of PLS models is reported in this section.

4.5.1 Lateral Collinearity (Inner VIF)

Kock and Lynn (2012) highlighted the possibility where the presence of lateral collinearity in a structural model might distort outcomes due to its strong ability in masking causal effects in a model. Lateral collinearity, also known as the predictor-criterion collinearity, was assessed using inner VIF values. Similar to collinearity assessment in formative measurement models, the rule of thumb which indicates values exceeding 3.3 (Diamantopoulos and Siguaaw 2006) or 5 (Hair, Ringle, and Sarstedt 2011) is applied. Results tabulated in Table 31 suggest that the structural model is free from collinearity issues.

Table 31: Inner Variance Inflation Factor Values

	Employee Engagement	Transfer of Training	Organisational Citizenship Behaviour
Transfer of Training			1.519
Employee Engagement		1.603	1.604
Psychological Capital	1.000	1.603	2.106

4.5.2 Level of Coefficient Determination (R^2)

Upon confirming that collinearity issues did not exist in the structural model, the level of coefficient determination, R^2 , was determined (Hair et al. 2019). R^2 measures the level of variance explained in endogenous constructs (Shmueli and Koppius 2011). In other words, it measures the “in-sample predictive power” of endogenous constructs (Rigdon 2012).

Various interpretation of R^2 values were introduced (Cohen 1988; Chin 1998; Hair et al. 2017). Following Ringle et al. (2018)’s recommendation on the assessment of coefficient determination in management research, this study adopts Hair, Ringle, and Sarstedt (2011)

and Hair et al. (2017)'s rule of thumb whereby values of 0.25, 0.50, and 0.75 respectively present weak, moderate, and strong predictive power.

R^2 values of the endogenous constructs in this study, namely, EE, TOT, and OCB were 0.376, 0.499, and 0.342 respectively, thus, suggesting moderate levels of predictive accuracy.

4.5.3 Level of Effect Size (f^2)

Next, the level of effect size, f^2 , which indicates “the relative impact of a predictor construct on an endogenous construct” (Ramayah et al. 2018, 146) is examined. Similarly, values were obtained from PLS Algorithm, under the “f Square” section.

The formula reflects the degree to which an exogenous construct contributes to an endogenous construct (Ramayah et al. 2018). In other words, a higher f^2 value indicates a stronger degree to which an exogenous construct contributes to the explanation of an endogenous construct. Cohen (1988) suggested that effect sizes with values of 0.35, 0.15, and 0.02 are interpreted as large, medium, and small respectively, whilst values below 0.02 indicates no effect.

Following Cohen's (1988) rule of thumb, the relative impact of TOT on OCB (0.034) is small, while the impact of PsyCap on EE is strong (0.603). The effect of PsyCap on TOT (0.313), PsyCap on OCB (0.116), and EE on OCB (0.132) are considered as medium. The effect of EE on TOT, surprisingly, yielded no effect.

Table 32: Effect Size

	Employee Engagement	Transfer of Training	Organisational Citizenship Behaviour
Transfer of Training			0.034
Employee Engagement		0.000	0.132
Psychological Capital	0.603	0.313	0.116

4.5.4 Blindfolding-based Cross-Validated Redundancy Measure Using PLSpredict (Q^2)

Q^2 reflects the predictive accuracy of a path model (Geisser 1974; Stone 1974). Generally, blindfolding procedures “remove single points in the data matrix and replace the omitted points with mean and estimates of the model parameters” (Sarstedt et al. 2014; Hair et al. 2019). Q^2 values that are larger than 0 indicate that an endogenous construct, otherwise known as the dependent or mediating latent construct holds predictive accuracy of the structural model (Hair et al. 2019, 12); whilst values higher than 0, 0.25, and 0.50 represent the size of the predictive relevance of a path model in PLS.

However, acknowledging the limitations of the conventional metrics used to assess predictive validity in PLS models, namely Q^2 and q^2 in providing highly interpretable results (Shmueli et al. 2016) due to four reasons, namely “(1) Q^2 combines internal consistency with predictive accuracy, (2) its imputation fails to fully capture type of heterogeneity associates with true out-of-sample prediction, (3) inability to compute case-wise predictions nor prediction intervals for new cases, and (4) is strenuous to evaluate in contextual terms (Ramayah et al. 2018, 175), PLSpredict was deployed in this study. In support of the mentioned criticism, Sarstedt, Ringle, and Hair (2017, 21) asserted that Q^2 is only partially-considered as a measure of out-of-sample prediction. Therefore, to reinforce the assessment on predictive validity on the model, PLSpredict, a holdout-sample-based procedure that produces case-level predictions on either item or construct level to enhance predictive model assessment was carried out in this study (Shmueli et al. 2016).

The Q^2 of EE, TOT, and OCB were given as 0.363, 0.310, and 0.386 respectively, therefore indicating an acceptable level of predictive relevance and accuracy (Shmueli et al. 2016; Ogbeibu et al. 2020).

To assess the out-of-sample predictive power of the model, a 10-fold cross validation were determined and used over ten repetitions, as recommended by Witten, Frank, and Hall (2016), Shmueli et al. (2019), and Ogbeibu et al. (2020). At the item level, $Q^2_{predict}$ for all formative indicators of the final endogenous construct, OCB was significantly above zero (see Table 17). Therefore, the path model has a smaller prediction error compared to the naïve benchmark of linear models (Shmueli et al. 2019).

Shmueli et al. (2019) suggested an examination on RMSE, except in circumstances where the predictive error is highly unsymmetrical. To assess the pattern of distribution, the latent variable scores of endogenous constructs were loaded onto a web application on <http://psychstat.org/kurtosis>. The multivariate kurtosis score, 17.401 fell within the range of 20, and

therefore, suggesting symmetrical distribution of predictive error (Cain, Zhang, and Yuan 2017).

According to Shmueli et al. (2019) and Ogbeibu et al. (2020), a prediction model is deemed strong when all the PLS-SEM RMSE measurement indicators of the endogenous construct yield lower values as compared to LM RMSE values. In circumstances where most PLS-SEM RMSE measurement indicators of the endogenous construct are lower than its LM counterpart, the model holds medium predictive power. Finally, a scenario where less PLS-SEM RMSE measurement indicators yield lower values than those of LM RMSE, the model suggests minor predictive power. Based on the results tabulated in Table 33, the model proposed in this study suggests high predictive power (Shmueli et al. 2019).

Table 33: PLSpredict Results at Indicator Level

	PLS-SEM		Linear Model	
	RMSE	Q ² _predict	RMSE	Q ² _predict
OCBI	0.896	0.204	0.904	0.189
OCBO	0.781	0.396	0.783	0.392

Table 34: PLSpredict Results at Construct Level

	RMSE	MAE	Q ² _predict
EE	0.808	0.594	0.360
OCB	0.781	0.635	0.401
TOT	0.842	0.641	0.310

4.5.5 Significance and Relevance of Structural Model Relationships

Upon substantiating the explanatory and predictive power of the structural model, Hair et al. (2019) recommended the examination of significance and relevance of structural model relationships. In other words, the proposed hypotheses of this study (see list of proposed hypotheses) were tested.

Table 35: List of Hypotheses Testing Outcomes

List of Hypotheses		Results
H1	Psychological capital positively influences employee engagement.	Supported
H2	Employee engagement positively influences transfer of training.	Not supported
H3	Psychological capital positively influences transfer of training.	Supported
H4	Employee engagement mediates the relationship between psychological capital and transfer of training.	Not supported
H5	Employee engagement positively influences organisational citizenship behaviour.	Supported
H6	Psychological capital positively influences organisational citizenship behaviour.	Supported
H7	Transfer of training positively influences organisational citizenship behaviour.	Supported
H8a	Transfer of training mediates the relationship between employee engagement and organisational citizenship behaviour.	Not supported
H8b	Transfer of training mediates the relationship between psychological capital and organisational citizenship behaviour.	Supported

According to Ramayah et al. (2018) and Hair et al. (2019), three rules apply to hypotheses testing procedures. First, p values must be lesser than 0.05 to establish statistical significance.

Second, absolute t-values must exceed the critical value of 1.96 (at 5% significance level) or 2.58 (at 1% significance level to declare statistical significance whilst reject the null hypothesis). Third, the value of zero must not straddle within the bias-corrected confidence interval at 97.5%. Besides, path coefficients are interpreted in such a way that values close to +1 indicate a strong positive relationship and vice-versa (Hair et al. 2019). The grounds on which the hypotheses are supported or otherwise, as well as brief discussions on these results are presented in the following sub-sections:

4.5.5.1 PsyCap and EE

The results in this study (tabulated in Table 36) were supportive of H1, whereby its path coefficient (0.613) suggested a positive relationship between PsyCap and EE. The relationship was statistically significant as $p < 0.001$ and its t-value 14.155 exceeded the critical value of 1.96 (at significance levels $\alpha = 0.01$). Consistent with past studies' findings (i.e. Siu, Bakker, and Jiang 2014; Pouramini and Fayyazi 2015; Grover et al. 2018; Tisu et al. 2020; Barreiro and Treglown 2020), PsyCap was found to exhibit positive influence on EE among youth participants of Industrial Revolution 4.0 in Sarawak.

Youth who possess positive psychological resources, such as efficacy, resilience, hope, and optimism, find themselves absorbed, dedicated, and vigorous in their work. Thus, youth with positive psychological resources are likely to exhibit high levels of engagement, as postulated by Barreiro and Treglown (2020). The positive influence of PsyCap on EE confirmed the second and fifth proposition of the JD-R theory, such that personal resources exerted similar functions as job resources to encourage engagement (Demerouti et al. 2001; Hakanen, Schaufeli, and Ahola 2008; Bakker and Demerouti 2017; Grover et al. 2018; Kotzé 2018).

4.5.5.2 EE and TOT

Contrarily, H2 which suggested a positive relationship between EE and TOT was not supported as its t-value and p value exhibited non-significance ($\beta = 0.015, t = 0.206, p = 0.837$). Furthermore, the value of zero was straddled between the lower and upper boundaries of the 97.5% confidence interval. While Nik Nazli and Sheikh Khairudin (2018) found a positive and significant relationship between EE and TOT among members of the Malaysian civil defence force, this study, however, produced contradictory findings. Results indicated inadequacy to reject the null hypothesis of the mentioned relationship among youth participants of Industrial Revolution 4.0 in Sarawak.

As a recap, TOT was operationalised as a job resource in this study while EE was seen as a “positive, fulfilling, affective-motivated state of work related wellbeing” (Bakker et al. 2008). Surprisingly, the said finding did not conform to theoretical proposition of the JD-R theory,

such that psychological aspects stimulates personal growth, learning, and development (Bakker and Demerouti 2007; 2017). The insignificance of the relationship between EE and TOT has also violated the job crafting proposition of the JD-R theory which suggested that motivated individuals will likely generate more job resources through proactive task alteration (Bakker, Tims, and Derks 2012). Furthermore, this is antithetical to the B&B theory which suggested that positive emotions will elicit behavioural alteration and acquirement of sustainable resources (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013).

Possible explanations to such phenomenon are as follows. EE refers to a motivational state in executing work roles. While PsyCap substantially influences EE and TOT (as discussed in the following sub-section), this study suggests that youth equipped with PsyCap may exhibit EE as the individual likely perceives his commitment to work goals as mechanism to increase likelihood of personal success. However, an individual may not necessarily transfer acquired knowledge, skills, or attitude to the workplace on the sole basis of EE. As stated in earlier chapters of this thesis, an alarming 83% of Malaysian employees are either disengaged or actively disengaged at work due to dispossession of personal development opportunities Gallup Inc. (2017). In the case of youth participants of Industrial Revolution 4.0 in Sarawak, the participants may have acquired digital competency, but withheld them, to a certain extent from work due to engagement issues.

4.5.5.3 PsyCap and TOT

Congruent to the work of Combs, Luthans, and Griffith (2009), the third hypotheses of this study, which proposed a positive relationship between PsyCap and TOT, is supported ($\beta = 0.575, t = 9.136, p < 0.001$). Besides, results confirmed Nolzen's (2018) assertion that PsyCap promotes job resources.

Although the interaction between personal resources such as PsyCap and job resources, such as digital competencies incorporated in the TOT construct remains ambiguous from in the JD-R domain, the influence of PsyCap on TOT may be explained using the B&B theory. Vacharkulksemsuk and Fredrickson (2013) argued that positive psychological capacity leads to the expansion of resources. In practical terms, PsyCap apprehends the motivational and emotional capacity of individuals and leverages work-related outcomes (Grover et al. 2018).

4.5.5.4 Mediating Role of EE in the Relationship between PsyCap and TOT

As recommended by Hayes (2014) and Zhao, Lynch, and Chen (2010), bootstrapping procedure is carried out to test for mediation via indirect effect. At 5000 resamples, two-tailed test, and a significance level of 0.05, H4 ($\beta = 0.009, t = 0.204, p < 0.001$) was not supported as EE did not mediate the relationship between PsyCap and TOT despite the direct effect

between PsyCap and TOT. Therefore, a direct-only non-mediation was found (Zhao, Lynch, and Chen 2010). This study failed to provide adequate evidence to reject the null hypothesis because (i) its t-value failed to meet the threshold level of 1.96 at 97.5% confidence interval, and (ii) a value of 0 is straddled between its bias-corrected confidence intervals.

4.5.5.5 EE and OCB

The positive influence of EE on OCB among youth participants of Industrial Revolution 4.0 in Sarawak ($\beta = 0.325, t = 5.619, p < 0.001$) is consistent with findings of extant literature, such as the works of Rich, Lepine, and Crawford (2010), as well as Madan and Srivastava (2017).

Theoretically speaking, engaged individuals generally do not draw boundaries in allocation of physical, emotional, or cognitive energies at work (Schaufeli et al. 2002; Schaufeli and Bakker 2010; Rich, Lepine, and Crawford 2010; Bakker and Demerouti 2017). While the mentioned relationship may not be reciprocal in nature, as suggested by Messersmith et al. (2011) on the basis of SET, the positive influence of EE on OCB is supported by proposition 2 of the JD-R theory. To reiterate, the second proposition of the JD-R theory posits that engagement predicts organisational commitment (Bakker and Demerouti 2017). Additionally, this particular finding is also supported by the B&B theory, whereby positive psychological state, such as EE, will result in extension of social resources (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013).

4.5.5.6 PsyCap and OCB

In line with existing studies (i.e. Avey, Luthans, and Youssef 2009; Norman et al. 2010; Beal, Stavros, and Cole 2013; Pouramini and Fayyazi 2015; Salas-Vallina, Alegre, and Fernandez 2017), results supported the fifth hypothesis of this study, which stated that PsyCap positively influences OCB ($\beta = 0.350, t = 5.645, p < 0.001$).

The theoretical support to this finding was built on Frederickson's B&B theory, whereby positive affect leads to broader social resources. Additionally, the JD-R theory suggested synonymy between job resources and personal resources, while the second proposition of the model claimed that resources predict organisational commitment (Bakker and Demerouti 2017). Further underpinned by the reciprocal relationship that exists between motivation and resources (Bakker and Demerouti 2017), based on this validated relationship, personal resources will spur employees' commitment towards organisations, and increase the pool of social resources for mutual benefit.

4.5.5.7 TOT and OCB

Examined against Industrial Revolution 4.0 in Sarawak characterised by dynamism, the proposed positive relationship between TOT and OCB was found to be significant ($\beta = 0.162, t = 2.701, p < 0.10$). Furthermore, the value of zero was not found to straddle between the confidence interval. The said finding adds to the empirical understanding on the relationship between TOT and OCB, apart from Nik Nazli and Sheikh Khairudin's (2018) study on the Malaysian civil defence force.

From a theoretical perspective, the mentioned relationship is anticipated as job resources are predictors of organisational commitment (Bakker and Demerouti 2017). Furthermore, the acquiring of job resources was found to influence social interaction to enhance an employees' perception of work (Wrzesniewski and Dutton 2001a; Tims and Bakker 2010; Bruning and Campion 2018).

4.5.8 Mediating Role of TOT in the Relationship between EE and OCB

As recommended by Hayes (2014) and Zhao, Lynch, and Chen (2010), bootstrapping procedure is carried out to test for mediation via indirect effect. At 5000 resamples, two-tailed test, and a significance level of 0.05, results indicated H8a ($\beta = 0.002, t = 0.188, p > 0.10$) was not supported as TOT did not mediate the relationship between EE and OCB despite the presence of direct effect between EE and OCB (see H5), therefore classified as direct-only non-mediation (Zhao, Lynch, and Chen 2010). This study did not provide sufficient evidence to reject the null hypothesis as (1) its t-value failed to meet the threshold level of 1.645 at 10% significance level, (i) p-value exceeded 0.10, and a value of 0 was straddled between its bias-corrected confidence intervals.

4.5.9 Mediating Role of TOT in the Relationship between PsyCap and OCB

On the other hand, results indicated that TOT mediates the relationship between PsyCap and OCB ($\beta = 0.294, t = 5.720, p < 0.001$), therefore, rendering support for H8b. In the presence of direct effect (see H6), complementary mediation was established (Zhao, Lynch, and Chen 2010). Consistent with Bates and Khasawneh (2005), Wang et al. (2010), Grover (2018) and Nik Nazli and Sheikh Khairudin's (2018) studies, TOT has exhibited properties as a mediator in the relationship between PsyCap and OCB.

Table 36: Structural Model Assessment Results

Relationship	Standardised Beta (β)	STDEV	t-Value	P Values	97.5% Confidence Interval	Decision	VIF	f^2	R^2	$Q^2_{predict}$
H1 PsyCap \rightarrow EE	0.613	0.043	14.155	0.000	[0.511, 0.685]	Supported	1.000	0.603	0.376	0.360
H2 EE \rightarrow TOT	0.015	0.074	0.206	0.837	[-0.145, 0.149]	Not Supported	1.603	0.000	0.342	0.310
H3 PsyCap \rightarrow TOT	0.575	0.063	9.136	0.000	[0.441, 0.687]	Supported	1.603	0.313		
H4 PsyCap \rightarrow EE \rightarrow TOT	0.009	0.013	0.204	0.839	[-0.092, 0.091]	Not Supported				
H5 EE \rightarrow OCB	0.325	0.058	5.619	0.000	[0.213, 0.442]	Supported	1.604	0.132	0.499	0.401
H6 PsyCap \rightarrow OCB	0.350	0.062	5.645	0.000	[0.223, 0.467]	Supported	2.106	0.116		
H7 TOT \rightarrow OCB	0.162	0.060	2.701	0.007	[0.033, 0.272]	Supported	1.519	0.034		
H8a EE \rightarrow TOT \rightarrow OCB	0.002	0.013	0.188	0.851	[-0.024, 0.029]	Not Supported				
H8b PsyCap \rightarrow TOT \rightarrow OCB	0.294	0.051	5.720	0.000	[0.193, 0.303]	Supported				

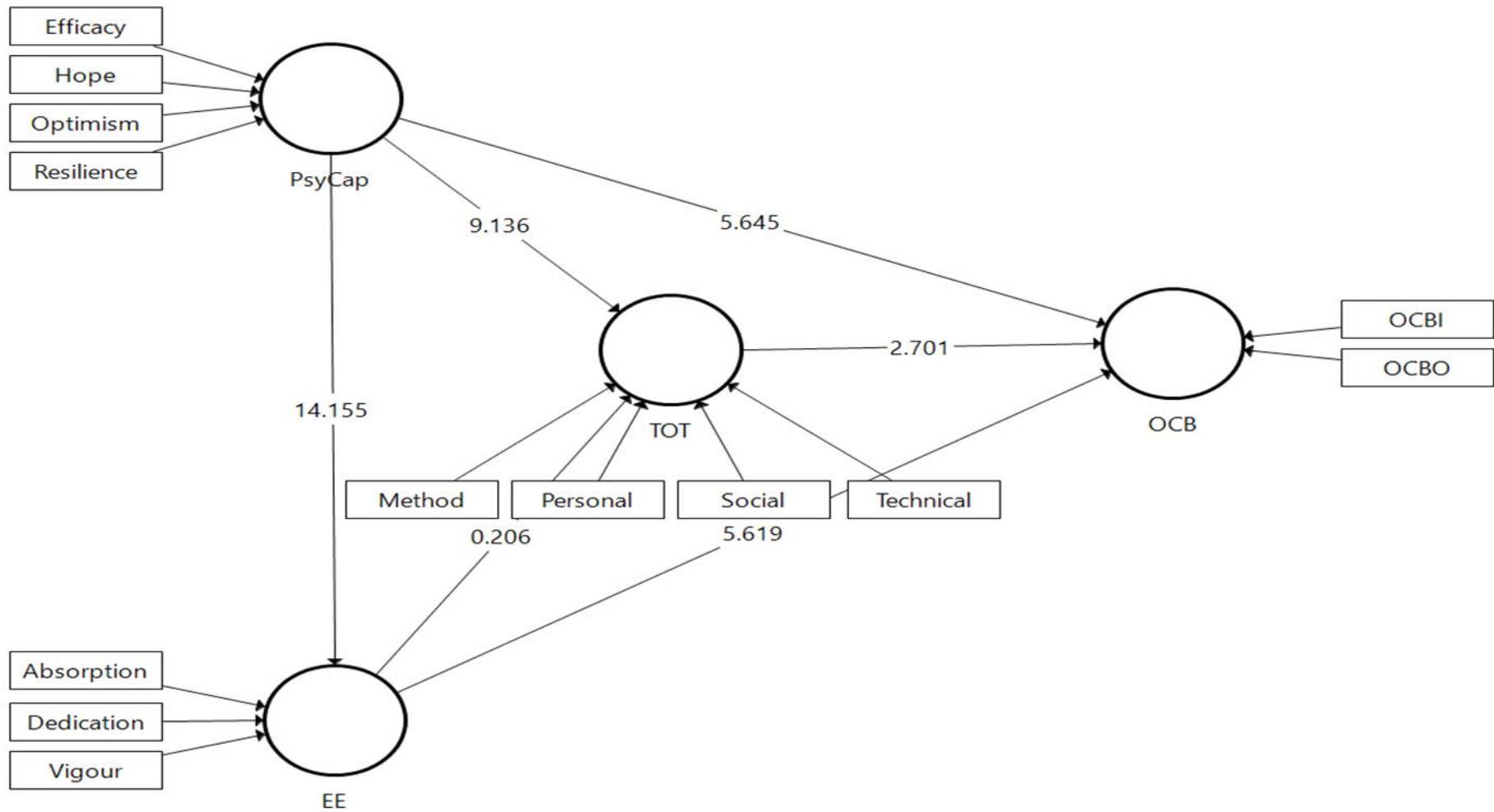


Figure 5: Structural Path Model with t-values

4.6 Chapter Summary

Analysis was carried out using two main statistical software, namely the Statistical Package for the Social Sciences (SPSS) and SmartPLS. Descriptive statistics were generated using SPSS whilst SmartPLS was used to assess the measurement model and structural model. To ensure that the sample size exhibits sufficient statistical power for analysis, G*Power was used. The post-hoc results indicated that a sample size of 251 yields 99.97% of statistical power.

In assessing the measurement model, all latent variables- PsyCap, EE, TOT, and OCB were examined as hierarchical component models (HCMs) assuming a reflective-formative measurement. Becker et al.'s (2012) disjoint two-stage approach was adopted to assess the HCMs.

In the first stage, only the lower order constructs of PsyCap (efficacy, resilience, hope, and optimism), EE (vigour, dedication, and absorption), TOT (technical competency, methodological competency, personal competency, and social competency), and OCB (OCB-I and OCB-O) were assessed according to guidelines for a reflective measurement model. A total of five out of fifty-three indicators were removed from the measurement models, thus, satisfying the requirement where not more than 20% of the indicators in the model should be deleted (Ramayah et al. 2018). The removal of indicators (RES1, RES3, RES5, OP2, and OP5) were either due to loadings lesser than 0.4, or their removal resulted in a significant increase in AVE. Discriminant validity between vigour and absorption, methodological competencies and technical competencies, as well as resilience and optimism were not established. Therefore, based on theoretical support, Henseler, Ringle, and Sarstedt's (2015) recommendation of merging the constructs, and the initial specification of PsyCap, EE, and TOT as HCMs, the issue was alleviated.

In the second stage, latent variable scores extracted from the first stage were used as indicators. As the higher-order constructs of PsyCap, EE, and TOT were measured formatively, Mode B was assigned, as recommended by Sarstedt et al. (2019). The default mode was applied to OCB for it is measured reflectively. Results suggested that convergent validity was established as path coefficients exceeded 0.70. Besides, horizontal collinearity was absent from the model and weights were all retained.

Assessment of structural paths revealed that the structural model is free from lateral collinearity issues. Results from PLSpredict suggested that the model possessed moderate predictive power. Besides, six out of nine proposed paths were statistically significant, and the hypotheses were supported (excluding H2, H4, and H8a).

Further discussions based on the results will be submitted for review in the next milestone. In the actual thesis, the discussions on the hypotheses will be grouped according to the research objectives, as detailed in Chapter 1.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

This chapter begins with a brief review on the objectives and hypotheses findings of this study, of which discussions will be based on. Subsequently, the contributions of this study in terms of theory, empirical evidence, methodology, and practice are highlighted. The limitations of this study, as well as recommendations for future studies are drawn.

5.1 Review of Research Questions, Objectives and Hypotheses Testing Results

The research questions of this study are:

- a) How will PsyCap and EE encourage TOT among youth participants of Industrial Revolution 4.0 in Sarawak?
- b) How will PsyCap, EE, and TOT influence OCB among youth participants of Industrial Revolution 4.0 in Sarawak?

Based on the research questions, the objectives of this study are:

- a) To examine the relationship between PsyCap and TOT and EE and TOT respectively
- b) To examine EE as the mediator in the relationship between PsyCap and TOT
- c) To examine the relationship between EE and OCB as well as PsyCap and OCB respectively
- d) To examine TOT as mediator in the EE and OCB relationship as well as the PsyCap and OCB relationship respectively.

Data collected from 251 youth participants of Industrial Revolution 4.0 in Sarawak with the use of the PCQ, UWES-9, TOT-DC, and OCB-8 Item Scale revealed the following results:

Table 37: List of Hypotheses

	List of Hypotheses				Results
H1	Psychological engagement.	capital	positively	influences	employee Supported

H2	Employee engagement positively influences transfer of training.	Not supported
H3	Psychological capital positively influences transfer of training.	Supported
H4	Employee engagement mediates the relationship between psychological capital and transfer of training.	Not supported
H5	Employee engagement positively influences organisational citizenship behaviour.	Supported
H6	Psychological capital positively influences organisational citizenship behaviour.	Supported
H7	Transfer of training positively influences organisational citizenship behaviour.	Supported
H8a	Transfer of training mediates the relationship between employee engagement and organisational citizenship behaviour.	Not supported
H8b	Transfer of training mediates the relationship between psychological capital and organisational citizenship behaviour.	Supported

The following section seeks to address research questions which led to the conception of the mentioned research objectives and proposed hypotheses.

5.2 Discussion

5.2.1 The Relationship between Psychological Capital, Employee Engagement and Transfer of Training

Extant literature insufficiently caters to understanding of the interaction between personal resources and job resources (Bakker and Demerouti 2017; Grover et al. 2018), as well as how “emotional responses elicit resources experienced by employees” (Bailey et al. 2017, 37). The gaps identified signifies an empirical loophole and a theoretical void respectively. In practical terms, the unresolved issues with training transfer due to personal motivation (Elliott, Dawson,

and Edwards 2009; Bates 2004; Reio et al. 2017; Baldwin, Ford, and Blume 2017) are associated with the mentioned inadequacies. This objective also seeks to answer vagueness in individual factors that enhance training effectiveness- a destitution of the KTEM model (Bates 2004; Reio et al. 2017).

To reiterate, PsyCap, TOT, and EE are operationalised as a personal resource, job resource, and a motivational state governed by positive emotions respectively. Therefore, in attempt to advance understanding on how training transfer could be optimised, this study seeks to examine the relationship between PsyCap, EE, and TOT among youth participants of Industrial Revolution 4.0 in Sarawak through three sets of hypotheses, namely: H1, H2, H3, and H4. Results reveal that PsyCap positively influences EE and TOT. However, results are inadequate to substantiate the proposed relationship between EE and TOT. Discussions in the following sub-sections shall attempt to testify the findings.

5.2.1.1 PsyCap and EE

Consistent with past studies' findings (i.e. Siu, Bakker, and Jiang 2014; Pouramini and Fayyazi 2015; Grover et al. 2018; Tisu et al. 2020; Barreiro and Treglown 2020), PsyCap was found to exhibit positive influence on EE among youth participants of Industrial Revolution 4.0 in Sarawak ($\beta = 0.613, t = 14.155, p < 0.001$). The similarity in findings are attributed to the positive influence of PsyCap on the perception of employees towards their work environment, which immediately translates into engagement. The positive influence of PsyCap on EE confirms the second and fifth proposition of the JD-R theory, such that personal resources exert similar functions as job resources to encourage engagement (Demerouti et al. 2001; Hakanen, Schaufeli, and Ahola 2008; Bakker and Demerouti 2017; Grover et al. 2018; Kotzé 2018).

Among all the relationships hypothesized, the positive influence of PsyCap on EE is the strongest as its path coefficient yields the highest value ($\beta = 0.613$). It is also noteworthy that given the high t-value, results of this study testify strongly against the null hypothesis and support that youth participants of the Industrial Revolution 4.0 in Sarawak who possess positive psychological resources characterised by efficacy, resilience, hope, and optimism find themselves absorbed, dedicated, and vigorous in their work. Thus, youth with internalised sense of control are likely to exhibit high levels of engagement, as postulated by Tims, Bakker, and Derks (2012) and Barreiro and Treglown (2020). A research by Sabaitytė and Diržytė (2016) pointed out that unemployed youth are susceptible to psychosomatic symptoms and psychological distress, where both indicate

low levels of PsyCap. Contrastingly, respondents of this study are employed youth who have been exposed to career development opportunities. Thus, a positive finding was expected.

5.2.1.2 EE and TOT

As a recap, TOT is operationalised as a job resource in this study while EE is seen as a “positive, fulfilling, mindful, and affective-motivated state of work related wellbeing” (Bakker et al. 2008). While Nik Nazli and Sheikh Khairudin (2018) found a positive and significant relationship between EE and TOT among members of the Malaysian civil defence force, this study, however, produces contradictory findings ($\beta = 0.015, t = 0.206, p > 0.1$). Results indicate inadequacy to reject the null hypothesis of the mentioned relationship among youth participants of Industrial Revolution 4.0 in Sarawak. Antithetical to the B&B theory which suggested that positive emotions will elicit behavioural alteration and acquirement of sustainable resources (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013), findings of this study have proven otherwise.

PsyCap substantially influences EE and TOT (see Section 5.2.1.1 and Section 5.2.1.3), as an individual capable of appraising circumstances and increase likelihood of success would preserve energy to remain engaged at work and generate job resources to buffer against job demands (Lee and Eissenstat 2018). However, an individual may not necessarily transfer acquired knowledge, skills, or attitude to the workplace on the sole basis of EE. Since the link between EE and TOT is empirically missing in extant literature and the only point of reference is Nik Nazli and Sheikh Khairudin's (2018) study on the Malaysian civil defence force which shares similar cultural background as this study, possible explanations to the phenomenon among youth participants of Industrial Revolution 4.0 in Sarawak is due to the (i) reliance of EE on job or personal resources and (ii) the confined nature of EE within work contexts.

The JD-R theory evinces the role of personal resources or job resources in fostering engagement (Kwon and Kim 2020), but the reverse remains a vague area. According to Bakker and Demerouti (2007), Bakker and Demerouti (2017), as well as Kwon and Kim (2020), engagement and its positive outcomes are dependent on the availability of job or personal resources as the latter exerts buffering effect on job demands to sustain engagement. In other words, without the presence of a personal resource or job resource, engagement is prone to diminish. Conversely, resourceful individuals would actively and continuously generate job resources to attain work improvements (Cenciotti, Alessandri, and Borgogni 2017). Furthermore, individuals who are actively engaged at work are not necessarily keen at building personal resources (De Waal and Pienaar 2013). Reflecting on similar functionality of job resources and personal resources (Bakker and

Demerouti), this study suggests that engaged individuals may not be inclined to generate job resources by engaging in TOT. Specifically, youth participants of Industrial Revolution 4.0 in Sarawak may not transfer digital competencies to the workplace just because they are engaged at work. Instead, youth were known to exhibit relaxed attitude towards work as compared to elder counterparts (Ooi et al. 2017). Salmela-Aro and Upadyaya (2018) shared a similar view that young employees are less engaged at work, and therefore, may affect levels of job resources. Moreover, career trajectories have become increasingly non-linear among the youth, thus, affecting inclination of youth of transferring knowledge, skills, and attitude to their current workplace (JP Morgan Chase and Co. 2017).

Second, EE is built on the premise of Kahn's (1990) personal engagement. According to Khan (1990, 3), engagement is defined as the "psychological experiences of work and its contexts that determines their presence at work". From this point of departure, the Utrecht perspective of EE is conceived. Similar to PsyCap, EE is perceived as a "state-like" condition characterised by affect and cognition (Sweetman and Luthans 2010). However, EE is bestowed by an employee in response to experienced and perceived benefits from the immediate work environment (Bailey et al. 2017). Bailey et al.'s (2017) claims are further substantiated as engagement among youth are found to be heavily reliant on exchange relationships (Krauss et al. 2020), as opposed to PsyCap-which largely stems from an individual's psychological capacity and personal drive to succeed (Nolzen 2018). In addition, the definition of EE involves mindfulness which is present-oriented as compared to PsyCap which extends beyond time and context (Roche, Haar, and Luthans 2014).

Therefore, EE has not exerted significant influence on TOT, a job resource, among youth participants of Industrial Revolution 4.0 in Sarawak, perhaps, due to the reliance of EE on personal or job resources and its confined nature within the workplace.

5.2.1.3 PsyCap and TOT

Congruent to the work of Combs, Luthans, and Griffith (2009) and Cenciotti, Alessandri, and Borgogni (2017), the third hypothesis of this study, which proposed a positive relationship between PsyCap and TOT is supported ($\beta = 0.575, t = 9.136, p < 0.001$). The positive and significant influence of PsyCap on TOT further confirms Nolzén's (2018) assertion that PsyCap promotes job resources.

From a theoretical standpoint, this finding has also shed some light on the currently ambiguous interaction between personal resources and job resources within the JD-R theory (Grover et al.

2018) due to incongruence between role and resource job crafting perspectives in recognising the role of cognition at generating job resources. The resource-based view perceives cognition as merely passive adaptations to work without actual alterations to resources (Tims and Bakker 2010; Bakker, Tims, and Derks 2012; Zhang and Parker 2018). This finding has also confirmed a proposition residing within the B&B theory that suggests that psychological capacity leads to the expansion of resources (Vacharkulksemsuk and Fredrickson 2013).

Pinned against a dynamic working environment characterised by rapid digitalisation, results of this study suggest that youth participants of Industrial Revolution 4.0 in Sarawak are capable of transferring digital competencies to the workplace to keep up with evolving job demands. While the relationship between EE and TOT is found insignificant and effect-less ($f^2 = 0.000$), the relationship between PsyCap and TOT is found to be moderate ($f^2 = 0.313$).

Additionally, PsyCap apprehends the motivational and emotional capacity of individuals and extends beyond work roles (Grover et al. 2018). From this viewpoint, this study suggests that the superiority of PsyCap over EE in predicting TOT is substantially influenced by the scope of influence. In earlier sections, digital competencies were incorporated in the TOT construct as i) human resource practitioners and policy makers lauded training as an essential tool to develop digital competencies (Hecklau et al. 2016), (ii) without actual application of digital competencies at the workplace, no transfer has been made in accordance to the definition of TOT (Baldwin, Ford, and Blume 2017) and (iii) scholars have emphasized on the importance of contextualised knowledge, skills, and attitude as a measure of TOT (Cheng and Hampson 2008; Cheng, Sanders, and Hampson 2015). Colbert, Yee, and George (2016), Alam et al. (2018), and Armstrong et al. (2018) posited that a digitally competent individual should possess lasting inclination and thought to lead a digitally enabled life while embracing digital transformations. Thus, as opposed to EE which focuses mainly on work roles, PsyCap extends beyond work boundaries and promotes the attainment of resources as adaptational behaviour.

Bailey et al. (2018) and Nolzen (2018) congruently asserted that EE and PsyCap have established weak practicality in HRM studies although both constructs exhibit possibility of being developed through training interventions. While Rickard et al. (2012)'s findings suggest that interventions focused on developing EE does not result in any surge, PsyCap is found elevated in the presence of training interventions (Nolzen 2018). Based on the findings of this study, PsyCap is found to positively influence TOT as opposed to EE. Therefore, this study suggests that PsyCap offers higher value towards strategic HRM practices to develop human capital.

While youth may be disadvantaged in terms of competence, identity, income, networks (Demerouti, Peeters, and van der Heijden 2012; Upadyaya and Salmela-Aro 2017; Salmela-Aro and Upadyaya 2018), inexperience, labour market information asymmetry, and effective communication capabilities towards employers (Mohd Ibrahim and Mahyuddin 2016), PsyCap holds great importance in personal development as employees equipped with the personal resource would be efficacious in directing necessary efforts to accomplish challenges, positively appraise circumstances, persevere in adversity and demonstrate resilience in pursuing success (Luthans et al. 2010; Li 2018). Therefore, youth equipped with PsyCap are more willing to transfer their digital competencies to work to increase likelihood of career success. Such findings conform to the B&B theory which suggests that positive emotions would broaden an individual's behavioural repertoire and subsequently build more resources through positive task alteration (Fredrickson 2004b; Vacharkulksemsuk and Fredrickson 2013).

5.2.2 The Mediating Role of EE in the Relationship between PsyCap and TOT

The inclusion of EE, a construct driven by positive affect, cognition, and mindfulness as a mediating variable between the constructs of PsyCap and TOT attempts to enlighten the currently ambiguous theoretical understanding on the influence of emotional responses on job resources experienced by employees (Bailey et al. 2017, 37; Bakker and Demerouti 2017), besides examining the currently ambiguous interplay between personal and job resources (Grover et al. 2018). Additionally, the proposed mediating effect imposed by EE attempts to shed light on how TOT may be optimised- in response of Baldwin, Ford, and Blume's (2017) calling.

Contrary to claims, engaged employees perform better, they are capable of generating more resources (Bakker, Van Emmerik, and Van Riet 2008; Zeynep Yesim Yalabik, Rayton, and Rapti 2017) and more ready to engage in additional work behaviours (Schaufeli, Bakker, and Salanova 2006; Crawford, LePine, and Rich 2010). The results of this study do not support the mediating role of EE in the relationship between PsyCap and TOT ($\beta = 0.009, t = 0.204, p > 0.1$) despite the direct effect between PsyCap and TOT. Therefore, a direct-only non-mediation is found (Zhao, Lynch, and Chen 2010). By comparing the results of this study which found a positive and significant relationship between PsyCap and EE as well as the unsupported relationship between EE and TOT to Schneider et al.'s (2018, 469) assertion that "a mediation effect potentially exists if antecedent-mediator and mediator-outcome relationships are significant", it is suggested that the issue lies with the influence of EE on TOT which is scarcely examined in extant literature.

EE has exhibited mediating properties across a variety of studies. For example, EE mediates the relationship between interpersonal relationships and turnover, as well as climate of diversity and turnover among nurses in the healthcare system (Collini, Guidroz, and Perez 2015). In another similar setting, EE is found to mediate the relationship between service climate and patient-centred care behaviour. The JD-R theory suggests that job resources and personal resources are capable of influencing engagement (Bakker and Demerouti 2017). As a recap, the JD-R theory falls short of informing the effect of emotional responses on the resources experienced by employees. The B&B theory, however, suggests that positive affect encourages expansion of resources (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013). However, Bailey et al. (2017, 44) cautioned researchers against the complexities and vague conceptualisation of engagement as well as ambiguous alignment of engagement in theory. Therefore, the direct-only non-mediation relationship is not surprising. Other possible explanations may be (i) the influence of exchange in employment relationships, (ii) the durability of the construct, and (iii) contextual variations.

Exchange relationships are strongly infused in EE (Yalabik et al. 2013; Yalabik, Rayton, and Rapti 2017; Bailey et al. 2017; Krauss et al. 2020). This indicates that engagement is a reciprocal function of job resources provided by employers. Although EE is perceived as a state-like construct, it may not be as lasting as personal resources (Sweetman and Luthans 2010). Therefore, engagement is prone to diminish without allocation of job resources. According to Saks (2019), EE is merely an expression of individuals during role performance. On the contrary, personal resources- particularly PsyCap is intricately linked to future time perspective as resourceful individuals are capable of appraising circumstances to increase likelihood of future success (Abubakar, Foroutan, and Megdadi 2019). As such, resourceful individuals are more prone to generate more resources through TOT to buffer against job demands. Kwon and Kim (2020) suggested that individuals are more inclined to invest himself in the immediate job environment as compared to utilise personal resources for long-term benefit, indicating that engaged individuals are not necessarily keen to transfer their skills, attitude and knowledge that require constant elimination, maintenance, application and maintenance. Furthermore, this study is conducted upon youth- an age group prominently known for their relaxed attitude towards work (Ooi et al. 2017) and career trajectories. Thus, youth participants of Industrial Revolution 4.0 in Sarawak are inclined to invest their personal resource and generate job resources, instead of generating job resources because they are engaged with the immediate job environment. Lastly, personal desire to succeed is superior against positive feelings towards the workplace (Nolzen 2018; Krauss et al. 2020).

5.2.3 The Relationship between Psychological Capital, Employee Engagement, Transfer of Training, and Organisational Citizenship Behaviour

As mentioned in earlier parts of this thesis, employers hesitate the provision of training due to training transfer failures. In turn, employer's complacency in recognising the value of training causes disengagement and subsequently, declining commitment towards organisational goals (Gallup 2017). While the first objective of this study gauges the influence of personal motivation on training transfer (Elliott, Dawson, and Edwards 2009), interaction between personal resources and job resources (Bakker and Demerouti 2017; Grover et al. 2018), as well as how "emotional responses elicit resources experienced by employees" (Bailey et al. 2017, 37). the third objective seeks to examine the relationships of PsyCap, EE, TOT, and OCB.

The effects of personal resources and motivation, representing contextual factors and emotional responses respectively, as well as the influence of job resources on approach role crafting represented by OCB, are examined through three sets of hypotheses, namely H5, H6 and H7 that show positive and significant relationships. The findings built on the these hypotheses may provide insights on the contextual factors and emotional responses that prompt resources experienced by employees (Bailey et al. 2017; Bakker and Demerouti 2017). In addition, this objective poses significance towards employers as approach role crafting behaviours are found to benefit organisations (Petrou, Demerouti, and Schaufeli 2018). Lastly, these relationships are central as a reflection of the fourth level in the KTEM model.

5.2.3.1 EE and OCB

According to Lazazzara, Tims, and de Gennaro (2020), approach role crafting is an aggregate function of work-role expansion and social expansion, defined as "self-initiated expansion of an individual's work role to include work elements that are not included in formal job descriptions" and "the allocation and contribution of resources to another collective member" respectively (Bruning and Campion 2018, 507). To reiterate, OCB is viewed as an approach role crafting behaviour that shares the same core values of maintaining the social and psychological wellbeing in organisations (Organ 1997; Bruning and Campion 2018).

The positive influence of EE on OCB among youth participants of Industrial Revolution 4.0 in Sarawak ($\beta = 0.325, t = 5.619, p < 0.001$) is consistent with findings of extant literature (e.g.: Saks 2006; Rich, Lepine, and Crawford 2010; Madan and Srivastava 2017; Saks 2019). Synonymous to past studies, this study confirms the theoretical standpoint that engaged

individuals generally do not draw boundaries in allocation of physical, emotional, or cognitive energies at work (Schaufeli et al. 2002; Schaufeli and Bakker 2010; Rich, Lepine, and Crawford 2010; Bakker and Demerouti 2017). While the mentioned relationship may not be reciprocal in nature, as suggested by Messersmith et al. (2011) on the basis of SET, the positive influence of EE on OCB is supported by proposition 2 of the JD-R theory.

To reiterate, the second proposition of the JD-R theory posits that engagement predicts organisational commitment (Bakker and Demerouti 2017). Additionally, this particular finding is also supported by the B&B theory, whereby positive psychological state, such as EE, results in the extension of social resources (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013). Therefore, engaged youth participants of Industrial Revolution 4.0 in Sarawak are found to contribute towards other collective members besides expanding the scope of their job to include elements that are not originally included in their formal job descriptions.

5.2.3.2 PsyCap and OCB

In line with existing studies (i.e. Avey, Luthans, and Youssef 2009; Norman et al. 2010; Beal, Stavros, and Cole 2013; Pouramini and Fayyazi 2015; Salas-Vallina, Alegre, and Fernandez 2017), results support the fifth hypothesis of this study, which posited that PsyCap positively influences OCB ($\beta = 0.350, t = 5.645, p < 0.001$).

The theoretical support to this finding is built on Frederickson's B&B theory, whereby positive affect leads to broader social resources. Additionally, the JD-R theory suggests synonymity between job-resources and personal resources, while the second proposition of the model claims that resources predict organisational commitment (Bakker and Demerouti 2017). Further underpinned by the reciprocal relationship that exists between motivation and resources (Bakker and Demerouti 2017), based on this validated relationship, personal resources will spur employees' commitment towards organisations and increase the pool of social resources for mutual benefit.

Interestingly, PsyCap similarly exhibits stronger magnitude of positive relationships with OCB ($\beta = 0.350$) as compared to EE ($\beta = 0.325$) and TOT ($\beta = 0.162$). PsyCap- a relatively stable psychological state dominated by positive emotions and cognition is positively associated with OCB among youth participants of Industrial Revolution 4.0 in Sarawak as compared to the effects of EE on OCB (O'Driscoll and Roche 2017).

Contrary to the resource-based perspective of job crafting proposition that merely perceives cognition as passive adaptations to work without actual alterations to resources (Tims and Bakker

2010; Bakker, Tims, and Derks 2012; Zhang and Parker 2018), the positive relationship between PsyCap and OCB among youth participants of Industrial Revolution 4.0 in Sarawak is largely driven by the role of cognitively-driven personal resources. Hence, with reference to the job crafting proposition, individuals with high levels of personal resources are likely to invest and generate more job and social resources that will enhance their buffering ability against job demands.

As mentioned in earlier sections, the influence of contextual factors and emotional responses on job resources remains an ambiguous area within the JD-R theory (Bailey et al. 2017; Bakker and Demerouti 2017). While this study limitedly advances the understanding on the role of emotions in generating resources, personal resources are found to elicit resources experienced by employees and subsequently, brings organisational impact through approach role-crafting which enhances the psychological and social contexts at work as well as result in performance.

5.2.3.3 TOT and OCB

According to Okurame (2012), the linkage between career growth prospects, such as training and the display of OCB is virtually absent. Moreover, literature have shown inconsistent results and inconclusive outcomes on the effect of TOT on work environment (Blume et al. 2010; Blume et al. 2019). The rationale for testing this relationship is further substantiated by the fourth level of the KTEM model which suggests value of training is only evident if positive results are generated at the workplace (Kirkpatrick 1996; Steensma and Groeneveld 2010; Nik Nazli and Khairudin 2018).

Examined against Industrial Revolution 4.0 in Sarawak characterised by dynamism, the proposed positive relationship between TOT and OCB is found to be significant ($\beta = 0.162, t = 2.701, p < 0.10$) and has yielded a small effect size whereby $f^2 = 0.034$. The said finding adds to the empirical understanding on the relationship between TOT and OCB, apart from Nik Nazli and Sheikh Khairudin's (2018) study on the Malaysian civil defence force which has similarly found a significant relationship between these constructs. The mentioned relationship is anticipated as job resources which are predictors of commitment (Bakker and Demerouti 2017). Given the increasing importance of individual's role as their job crafter, another perspective that may be obtained from this confirmed relationship is the proactiveness of a resourceful individual in generating more resources that enhance the working environment (Wrzesniewski and Dutton 2001a; Tims and Bakker 2010; Bruning and Campion 2018). As stated in an earlier section, youth require competence and extensive networks required to optimize work performance (Demerouti,

Peeters, and van der Heijden 2012; Upadyaya and Salmela-Aro 2017; Salmela-Aro and Upadyaya 2018). Findings of this study suggest that youth participants of Industrial Revolution 4.0 in Sarawak leverage on their job resources and enhance their working environment by expanding their roles as well as social ties. Nevertheless, youth are in their early career trajectories where resources are relatively rare (Upadyaya and Salmela-Aro 2017; Salmela-Aro and Upadyaya 2018), and are therefore, relatively conservative in allocating resources to other members in the organisation.

5.2.4 The Mediating Role of TOT in the Relationships between PsyCap, EE, and OCB

The fourth objective of this study is to examine the mediating effect of TOT on the relationships between PsyCap and OCB, as well as EE and OCB respectively, in attempt to obtain a wider view on the interaction between personal resources, motivation, job resources, and its pathway leading to role-crafting behaviour (Bruning and Campion 2018). Consistent to the result level of the KTEM model that suggests impacts that are beneficial to organisations (Kirkpatrick 1996; Steensma and Groeneveld 2010; Nik Nazli and Khairudin 2018), returns to the individual and the organisation are seemingly critical to dismiss complacency towards the importance of training.

Specifically, the inclusion of TOT as a mediator may inform if the presence of job resources will strengthen the relationship between personal resources and role expansion, as well as motivation and role expansion respectively. This will offer a holistic view on how different psychological states influence (i) the worrying level of training transfer and subsequently, (ii) behaviour beneficial to individuals and their organisation, as well as (iii) the role of job resources in its interaction with personal resources and role crafting. Consistent with Bates and Khasawneh (2005), Wang et al. (2010), Grover (2018) and Nik Nazli and Sheikh Khairudin's (2018) studies, TOT has exhibited mediating properties in the relationship between PsyCap and OCB ($\beta = 0.294, t = 5.720, p < 0.01$); but not in the relationship between EE and TOT ($\beta = 0.002, t = 0.188, p > 0.10$).

Hypotheses H8a and H8b are tested via mediation analysis. As recommended by Hayes (2014) and Zhao, Lynch, and Chen (2010), bootstrapping procedure is carried out to test for mediation via indirect effect. At 5000 resamples, two-tailed test, and a significance level of 0.05, results indicate that TOT mediates the relationship between PsyCap and OCB ($\beta = 0.294, t = 5.720, p < 0.001$), therefore, rendering support for H8b. In the presence of direct effect (see H6), complementary mediation is established (Zhao, Lynch, and Chen 2010).

TOT has exhibited properties as a mediator in the relationship between PsyCap and OCB. Earlier sections in this study highlighted the inconsistencies between the role and resource-based perspectives of job crafting behaviour that neglected the role of cognition in generating job resources as well as the pathway resulting in approach role crafting (Zhang and Parker 2018; Bruning and Campion 2018; Lazazzara, Tims, and de Gennaro 2020). In the case of youth participants of Industrial Revolution 4.0 in Sarawak, job and personal resources offer identical functionality as job resources (Bakker and Demerouti 2017), therefore, resourceful employees will actively engage in role-crafting by allocating resources to another individual and expand the scope of his duty to pursue common good. Moreover, findings suggest that job resources are not just outcomes of personal resources, but also strengthen the relationship between personal resources and social and psychological aspects in organisations.

On the other hand, H8a is proposed as mediators to the relationship between positive emotions and workplace benefits remain underexplored (Vacharkulksemsuk and Fredrickson 2013). H8a ($\beta = 0.002, t = 0.188, p > 0.10$) is not supported- suggesting that TOT does not mediate the relationship between EE and OCB despite the presence of direct effect between EE and OCB (see H5), therefore classified as direct-only non-mediation (Zhao, Lynch, and Chen 2010). This study does not provide sufficient evidence to reject the null hypothesis as (1) its t-value failed to meet the threshold level of 1.645 at 10% significance level, (i) p-value exceeded 0.10, and a value of 0 is straddled between its bias-corrected confidence intervals.

Findings of H8a contradict the B&B theory which suggests that positive emotions broaden an individual's intellectual, physical, social, or psychological resources to facilitate coping (Fredrickson 2004b; Vacharkulksemsuk and Fredrickson 2013). Despite generating consistent results with past literature that suggest that engaged individuals express themselves through display of OCB (e.g.: Saks 2006; Rich, Lepine, and Crawford 2010; Madan and Srivastava 2017; Saks 2019), engagement- a psychological state dominated by positive affect has no influence on job resources ($f^2 = 0.00$). The opposing results may be attributed to strong exchange relationships that are embedded within EE (Yalabik et al. 2013; Yalabik, Rayton, and Rapti 2017; Bailey et al. 2017; Krauss et al. 2020) and its confinement within work roles. In other words, the findings of this study fail to substantiate the strengthening of the relationship between work-related motivation and approach role-crafting. To reiterate, engagement among Malaysian youth are highly dependent on sense of belongingness in their organisations, fulfilment of their needs for development, empowerment in decision making, and the capacity to contract with peers and adults (Krauss et al. 2020). These elements suggest that a reciprocal relationship plays a larger role at

determining the display of OCB, rather than the actual rate of transfer of which hedges strongly on motivation (Elliott, Dawson, and Edwards 2009). Such explanation is supported through the magnitude of relationships between EE and OCB ($t = 5.619$), as well as TOT and OCB ($t = 2.701$) respectively.

5.3 Contributions of the Study

This section shall outline the contributions of this study.

5.3.1 Theoretical Contributions

5.3.1.1 Integration of Theories

According to Wilkins, Neri, and Lean (2019), integration of theory with rationale is a form of theoretical contribution. Additionally, a relatively complete understanding on the phenomenon under study may be obtained through multiple theoretical perspective (Mayer and Sparrowe 2013, 919). Generally, the failure of training transfer has been a pervasive issue that resulted in complacency of organisations in providing training opportunities (Training Workforce 2017). In turn, the dispossession of personal development opportunity among youth threatens not only the feasibility and social acceptance towards Industrial Revolution 4.0 (Kadir, Broberg, and Conceição 2019; Horváth and Szabó 2019), but also the capacity of organisations in securing digital dividends.

The JD-R theory offers explanation on how job resources could be leveraged and mitigate job demands to enhance employees' wellbeing, and subsequently, effective organisational functioning (Bakker and Demerouti 2017, 282). On the other hand, the B&B theory suggests that positive emotions broaden an individual's "behavioural repertoire" and builds durable skills and personal resources that facilitate coping (Fredrickson 2004a; Vacharkulksemsuk and Fredrickson 2013). The final theoretical anchor of this study is the KTEM model that evaluates training effectiveness (Kirkpatrick 1994). Each of these theories have their respective inadequacies. First, the JD-R theory falls short of explaining "contextual factors, interpersonal reactions, and emotional responses that elicit demands and resources experienced by employees" (Bailey et al. 2017, 37; Bakker and Demerouti 2017). Second, the B&B theory is inadequate in explaining the underlying link between positive emotions and workplace benefits (Vacharkulksemsuk and Fredrickson 2013). Lastly, the KTEM model falls short of identifying individual factors that enhance training effectiveness (Bates 2004; Reio et al. 2017). Therefore, the mentioned theories are integrated to complement their respective inadequacies.

Subsequently, the integrated theories are examined through the constructs of PsyCap, EE, TOT, and OCB in a single model. Extant literatures often study these constructs separately (Bakker and Demerouti 2007; Messersmith et al. 2011; Beal, Stavros, and Cole 2013; Pouramini and Fayyazi 2015; Grover et al. 2018; Nik Nazli and Sheikh Khairudin 2018; Bruning and Campion 2018) and therefore, inadequate to explain the influence of personal motivation on training transfer, and its subsequent effect on behaviour that benefits the organisation and the individual itself.

According to Shapira (2011), organisational studies are cumulative in nature. Thus, a model is capable of informing theory. By examining these constructs in a single model, a holistic understanding on the personal resources-job resources interaction and pathway leading to role-crafting behaviour that elucidates social and psychological wellbeing of their belonging organisations among youth participants of Industrial Revolution 4.0 is obtained.

While PsyCap and EE are both psychological states that represent personal motivation, the former is perceived as a personal resource (Grover et al. 2018; Nolzen 2018) and the latter is conceptualised as a motivation dominated by positive affect. The most prevalent distinctions between both constructs are their scopes and magnitude of cognition. TOT on the other hand, is operationalised as a job resource as the KTEM model suggests that without actual application of training outcomes to work, training effectiveness is not established (Kirkpatrick 1994; Steensma and Groeneveld 2010; Aluko and Shonubi 2014; Nik Nazli and Sheikh Khairudin 2018). Congruently, TOT is traditionally defined as (i) the extent of applying training outcomes constituting of knowledge, skills, and attitude to work contexts; and (ii) sustaining them over time (Baldwin and Ford 1988) and a series of choices in “discarding, maintaining, applying, or modifying” work elements (Baldwin, Ford, and Blume 2017). Lastly, OCB, a form of “behaviour that maintains and enhances the psychological and social context that reinforces task performance” (Organ 1997, 91) is perceived as a role-crafting behaviour that constitutes elements of work-role and social expansion (Bruning and Campion 2018; Lazazzara, Tims, and de Gennaro (2020).

This study has advanced understanding on the theories used. Results obtained from this study demonstrated superiority of contextual factor represented by personal resources over emotional responses in generating job resources. In addition, personal resources exert positive influence on the social and psychological aspects in organisation to mitigate job demands. Thus, PsyCap is not only the key to elevating TOT, but also influential in fostering OCB. A positive relationship is also found between job resources and role-crafting. This finding suggests that individuals who possess job resources are likely to invest and uplift the organisation by allocating resources to

other collective members and uptake extra roles that will benefit the organisation. Moreover, this study has shed light on the cruciality of cognition at influencing resources experienced by employees- an area that has been widely debated within the domains of job crafting (Zhang and Parker 2018; Lazazzara, Tims, and de Gennaro 2020) through the positive relationships of PsyCap and TOT, PsyCap and OCB, as well as the mediating effect of TOT in the relationship between PsyCap and OCB.

Additionally, the insignificant relationship between EE and TOT, the mediating role of EE in the relationship between PsyCap and TOT, as well as the mediating role of TOT in the relationship between EE and OCB respectively has revealed that durability of the construct and its application beyond work contexts is imperative in determining TOT and OCB- two elements that are of interest to employing organisations to consider training effectiveness. Other possible explanations are the pervasive disengagement issues among youth and the influence of exchange relationships governing EE. Furthermore, job resources are strong determinants of engagement. Whilst the hypothesised relationships are unsupported and violate the assumption of the B&B theory which evinces the ability of positive emotions at leveraging workplace resources, another possible reason may be due to the evolving nature of TOT. According to Baldwin, Ford, and Blume (2017), TOT is no longer merely the application of training outcomes at work, but also the ability to discard, maintain, and modify training outcomes.

5.3.1.2 Contextualisation of Transfer of Training (TOT)

To the best of the candidate's knowledge, this is the first study to reconceptualise the TOT construct by incorporating "digital competencies"- whose specifications have remained ambiguous in extant literature (Janssen et al. 2013; Murawski and Bick 2017). Scholars have emphasized on the importance of contextualised knowledge, skills, and attitude as a measure of TOT, where failure to incorporate is an indication of fruitless literature advancement (Cheng and Hampson 2008; Cheng, Sanders, and Hampson 2015). Digital competencies are crucial to sustain the viability of employees in dynamic, knowledge-intensive working environments. As this study sets to take place in Sarawak- a state at the initial stages of digital adoption, the "digital competencies" shall incline towards skills, knowledge, or attitudes required to work with the basic building block of Industrial Revolution 4.0 technologies.

Existing literature offer various composition of digital competency (e.g. Briggs and Mackice 2012; Hecklau et al. 2016; Alam et al. 2018; Armstrong et al. 2018). However, the list of skills, attitude, and knowledge lacks structure. By comparing the various definitions offered, the candidate has

defined the constituents of digital competencies based on four dimensions, namely, technical, methodological, social, and personal competencies. The identified competencies are then specified as an aggregate construct as removal of any dimensions that would distort the meaning of digital competency (Johnson, Rosen, and Chang 2011). The contextualisation of TOT constitutes a form of conceptual contribution, of which, according to Shapira (2011), constitutes importance to theory.

5.3.2 Empirical Contributions

5.3.2.1 Psychometric Properties of the TOT-DC Scale

According to Zangaro (2019), psychometric properties of instruments in terms of its construct reliability and convergent validity in research are imperative to evaluate its usefulness.

Due to the unavailability of instrument to measure digital competency which accounts for TOT, a scale is developed. The purpose of the TOT-DC scale is to identify the extent to which individuals are able to discard, maintain, apply, and modify training outcomes at work (Baldwin, Ford, and Blume 2017). In other words, the infusion of digital competencies in the TOT construct reflects the extent individuals would become digitally competent after attending training.

The three stages in developing the TOT-DC scale are: reviewing literature, constructing items, and pre-testing (Creswell 2012). Despite conflicting views on the use of exploratory factor analysis (EFA) in developing a new instrument, this study adheres to Mumtaz et al. (2017)'s advice, such that students may omit EFA provided where the questionnaire is well pinned with theories or literature and has undergone rigorous pre-testing. In such a manner, the TOT-DC scale is developed based on both theory and extant literature. Subsequently, the items are pre-tested prior to the final administration of the survey. The final instrument consists of 14 items encompassing dimensions of technical, methodological, social, and personal competencies, with the addition of a single global item.

The assessment of reflective measurement model informs that all four lower-order constructs of TOT have established sufficient internal consistencies and convergent validities (see Section 4.3.3). Subsequently, the results from assessing the formative measurement model of the construct suggest significant outer weights and absolute contribution of its indicators to the TOT construct (see Section 4.4.3).

5.3.2.2 Interaction between Personal Resources and Job Resources

The vague interaction between personal resources, job resources, and their influence on social and psychological aspects of individual's work (Grover et al. 2018; Bruning and Campion 2018) indicates an empirical loophole. This study seeks to offer insights by conceptualising TOT as a form of job resource and a mediator.

According to Bakker and Demerouti (2017), job resources possess the capacity to influence outcomes. Evidently, TOT mediates the relationship between PsyCap and OCB, despite failure to substantiate its mediating properties in the relationship between EE and OCB.

TOT has exhibited properties as a mediator in the relationship between PsyCap and OCB. Earlier sections in this study highlight the inconsistencies between the role and resource-based perspectives of job crafting behaviour that neglects the role of cognition in generating job resources as well as the pathway resulting in approach role crafting (Zhang and Parker 2018; Bruning and Campion 2018; Lazazzara, Tims, and de Gennaro 2020). In the case of youth participants of Industrial Revolution 4.0 in Malaysia, job and personal resources offer identical functionality as job resources (Bakker and Demerouti 2017), therefore, resourceful employees will actively engage in role-crafting by allocating resources to another individual and expand the scope of his duty to pursue the common good. Moreover, findings suggest that job resources are not just outcomes of personal resources, but also strengthens the relationship between personal resources and social and psychological aspects in organisations.

5.4 Implications of the Study

This study may be practically significant across managerial and socioeconomic areas. Therefore, this section shall recommend initiatives that will complement actual practice based on the findings of the study.

5.4.1 Managerial Implications

Responding to criticism on the weak practicality of PsyCap and EE in human resource practices (Bailey et al. 2017; Nolzen 2018), findings of this study demonstrate the superiority of PsyCap in influencing job resources and facilitating social and psychological aspects in work environments. By understanding the influence of psychological states, organisations may be further convinced to invest in training and developing employees. According to Nolzen (2018) and Luthans and Youssef-Morgan (2017), all four dimensions of PsyCap are state-like traits which can be

developed. Therefore, human resource practitioners may consider psychological capital intervention as a prelude to upskilling programs to increase the rate of training transfer and subsequently, reduce sunk costs.

Additionally, job resources, particularly TOT, positively influence OCB. OCB has been a favourable behaviour as employees who exhibit OCB are inclined to promote wellbeing of the social and psychological aspects in the organisation. In other words, good citizenship behaviour is imperative to the optimal functioning of organisations as well as pursuance of organisational objectives (Bruque, Moyano, and Piccolo 2016; Nik Nazli and Sheikh Khairudin 2018). While the results of this study do not substantiate the relationship between EE and TOT, the former is influential in encouraging OCB. Hence, organisations should recognise the benefits of training in generating long-term value, competitiveness, and retainment of skilful work-talents. Additionally, organisations may be enlightened that training leads to role expansion behaviour which nurtures the social and psychological aspects of the organisation. The findings of this study have also shown that PsyCap- a personal resource is superior against EE which is a form of motivation in predicting TOT. Moreover, the sustenance of EE requires job resources. Therefore, organisations should also be cautious of adverse effects such as declining commitment and engagement if insufficient development opportunities are not provided to employees.

Furthermore, the specification of digital competencies in this study may be useful for human resource practitioners in calibrating training curriculum. Existing literature offer various explanations on what constitutes digital competencies (e.g. Briggs and Mackice 2012; Hecklau et al. 2016; Alam et al. 2018; Armstrong et al. 2018). However, these explanations lack structure and an instrument for assessment. Therefore, subjected to achieving external validity, the tool may be used for assessing trainings required to develop an employee.

Considering the increasing importance of job crafting practices in theory (Bruning and Campion 2018; Zhang and Parker 2018; Lazazzara, Tims, and de Gennaro 2020) and practice (Kohll 2018), employers should initiate job crafting practices at the workplace. This study provides some evidence on the capacity of employees to generate job resources out of their personal resources and adjust their roles to achieve a better fit with the work environment. Such practice is highly imperative, especially under challenging and rapidly evolving environment characterised by digitalisation. Furthermore, ever changing job demands require proactive alterations towards job resources possessed.

These initiatives shall respond to Colbert, Yee, and George's (2016) calling to fill in knowledge gaps on how work-talents' performance can be effectively boosted whilst avoiding pitfalls of embracing Industrial Revolution 4.0. Specifically, organisations must recognise the value in upskilling the workforce to avoid issues of organisational resistance, which may subsequently impede successful introduction of new business models and technologies.

5.4.2 Socioeconomic Implications

This study also suggest socioeconomic implications. As suggested in the Eleventh Malaysia Plan (Economic Planning Unit 2016) and Sarawak Digital Economy Strategy (State Service Modernisation Unit 2017), Industrial Revolution 4.0 initiatives are central to economic growth. Nevertheless, past industrial revolutions have significantly affected social acceptance- one of the two crucial elements required to establish synergy between humans, machines, and data for successful implementation of Industrial Revolution 4.0 (Brynjolfsson and McAfee 2011; Müller 2019). Adverse social acceptance is highly attributed to labour market polarisation (Schwab 2016; Kovacs 2018; Galati and Bigliardi 2019; Müller 2019). The other element, feasibility, hedges on competencies of the future workforce (Kadir, Broberg, and Conceição 2019).

It is reiterated that competent workforce is pivotal to tapping digital dividends of the Industrial Revolution 4.0. Simultaneously, a World Youth Report by United Nations Department of Economic and Social Affairs (2018) has iterated the crucial roles of youth in economic development. The Department of Statistics Malaysia (2019) and the Labour Department of Sarawak (2018) jointly estimated that 44.2% of the total Sarawak population comprises of youth. Thus, proper youth development initiatives hold significant value in flourishing the state- be it from economic, environmental, or social areas. Youth often lack resources, namely competence, identity, income, or networks to optimize performance in dynamic work environments (Salmela-Aro and Upadyaya 2018) and these shortcomings increase their susceptibility to burnout as compared to elder employees. Therefore, policy formulation which strengthens youth conviction and resilience in their career trajectories is crucial. Further prompted by the rapidly evolving work environment characterised by Industrial Revolution 4.0, adaptability and educational reforms are increasingly crucial.

Based on the findings of this study, the presence of PsyCap and training opportunities are pivotal to generate favourable organisational outcomes. Therefore, youth conviction and resilience should be strengthened through collaborative and creative ideas to generate meaningfulness and internalisation among youth. Learning models and methods ought to be reviewed and modernized

to suit the demands of the future workforce. Besides, policymakers may foster development of youth by providing employing organisations with subsidy or tax exemption. This may encourage organisations to engage training opportunities for their young employees. Additionally, the state government of Sarawak and its digital economy governing body- Sarawak Multimedia Authority could offer more digital competency modules that allow its workforce to upskill themselves at a minimal cost. Joint transformational initiatives between the state government and private firms should be encouraged to increase awareness on the benefits of pursuing Industrial Revolution 4.0 from technical and social integration perspectives. Lastly, lifelong learning programmes may be instituted to ensure economic relevancy of the workforce and promote agility.

5.5 Limitations of the Study and Recommendations for Future Research

This section shall acknowledge several limitations of this study and subsequently, suggests future avenues of research.

First, the data obtained in this study were obtained through self-reported surveys. According to Podsakoff et al. (2003) and Tehseen, Ramayah, and Sajilan (2017), social desirability bias may arise when obtaining self-reported data from a common source. While procedural and statistical remedies were deployed in this study, and the Variance Inflation Factors demonstrated that the model is unlikely to be threatened by common method variance, where future studies should consider obtaining measures of independent and dependent variables from different sources (Podsakoff et al. 2014).

Second, due to Personal Data Protection Act 2010 (PDPA) restrictions, the candidate was unable to obtain a sampling frame from Industrial Revolution 4.0 training providers nor access for follow-ups through any form of contact. The candidate acknowledges the disadvantage of non-probability sampling, such as lack of representativeness and weak generalisability from the sample (Daniel 2014a; Etikan 2016). However, due to the involvement of specific elements of a population, time and resource constraint, as well as availability issues, non-probability sampling was the only sampling avenue. To ensure that the sample consists only of those under the target population, this study included a “Constraints on Generality” statement which stringently identifies the criteria of the target population that shall be generalised upon (Simons, Shoda, and Lindsay 2017; Goldberg et al. 2019). Future research with access to sampling frame should consider probability sampling or consider experimental designs for higher degree of control.

Third, this study assumed a cross-sectional design and therefore, limits the proof of causality, (Jacob and Ganguli 2016). Therefore, future research should consider longitudinal designs to

better inform of causal relationships between the variables (Creswell and Guetterman 2019; Memon, Salleh, and Baharom 2016).

Fourth, this study focuses solely on youth participants of Industrial Revolution 4.0 in Sarawak. Therefore, future research that wishes to draw upon the findings of this study to other setting should be done with caution (Memon, Salleh, and Baharom 2016). Given the strong predictive power of the model proposed in this study, the present model should seek validation in various sectors across wider geographical regions. In addition, future studies may consider conducting a multi-group analysis across various demographical backgrounds or training arrangements to obtain further insights on the influence of these variables on the relationships.

Fifth, this study found insignificant relationship between EE and TOT, as well as the failure of the former variable in mediating the relationship between personal resource, PsyCap and job resources, TOT. Further conceptual clarification on the nature of EE is required to address issues with its attitudinal space in theory (Bailey et al. 2017). In addition, future research may draw upon the Social Exchange Theory to draw inferences to which the nature of training arrangement (i.e. self-arranged or provided) would influence the above relationships.

5.6 Concluding Remarks

This study synthesised the relationships of PsyCap, EE, TOT, and OCB within a single model, underpinned by the JD-R theory, B&B theory, and KTEM model in attempt to answer the research questions outlined in the first chapter. Main findings of this study indicate that TOT as a job resource, functions as an outcome of personal resources and results in OCB- a role expansion behaviour that facilitates the wellbeing of the individual and their organisations. Furthermore, TOT has demonstrated mediating properties in the relationship between personal resource and role-crafting. Therefore, this study suggests that individuals with personal resources would actively generate resources that help to buffer against job demands. In other words, contextual factors exhibit superiority over emotional responses, EE, in influencing demands and resources experienced by employees.

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Appendix A- Final Instrument

Participant Information Sheet

Invitation to Participate

You are cordially invited to participate in this research project. Before you decide to do so, it is important for you to understand what the research is about, who the researcher is, and what is involved.

Therefore, please read the following information carefully. You may contact the researcher via email at qianhui.ting@postgrad.curtin.edu.my for further information or to clarify your doubts.

About the Research Project

Entitled “**The Role of Psychological Capital and Employee Engagement in Determining Organisational Citizenship Behaviour in the Industrial Revolution 4.0 Era: Transfer of Training as a Mediator.**”, this research intends to examine the effects of psychological capital and employee engagement on organisational citizenship behaviour; and the mediating role of transfer of digital competencies in these relationships. The responses are also important for policy, managerial, and economic recommendations that will facilitate human capital development as we gear up for Industrial Revolution 4.0.

The HREC Project Number of this research is: **HRE2019-0571**. This research will be conducted in accordance with the National Statement on Ethical Conduct in Human Research (2007) updated March 2014.

About the Researcher

The research is conducted by Ting Qian Hui, a Master of Philosophy candidate from Curtin University. The results obtained from this survey is will be used to fulfil requirements of the said degree.

About the Supervisors

The research is conducted under the supervision of the researcher’s thesis committee detailed as follows:

Chairperson	:	Dr. Shamsul Kamariah	(shamsul.a@curtin.edu.my)
		Abdullah	
Main-Supervisor	:	Associate Professor Goi Chai Lee	(goi.chai.lee@curtin.edu.my)
Co-Supervisors	:	Dr. Lew Tek Yew	(lew.tek.yew@curtin.edu.my)
	:	Dr. Adriel Sim Khoon Seng	(adriel.sim@curtin.edu.my)

About Your Participation

You have a choice to participate or not. You may also choose to withdraw from the project after you have decided to participate. Please be assured that you will not be identified or identifiable in the thesis, reports, conference papers, or any publications.

Your relationship with the staffs/colleagues/institution/researcher concerned will not be jeopardised if you opt out of the survey.

If you choose to withdraw, the researcher will destroy and disregard any information collected from you. You will NOT be required to provide reason for withdrawing from the study. Also, there will be no penalty or comments for withdrawals.

Please be informed that your participation is voluntary. There shall be no cost incurred on you. In a similar manner, you will not receive any form of incentives for participating in this research.

Please be advised that the research project is unlikely to cause you any disadvantages or discomfort, apart from spending approximately 15-20 minutes of your time to complete the set of questions.

Reason for Choosing You

You have been chosen to participate because as participants of a niche area of growing importance- Industry 4.0, you are equipped with essential knowledge, skills, and attitude that will offer insights on readiness of the Malaysian workforce to embrace Industrial Revolution 4.0. We anticipate that the results of the research will further encourage provision of training to maintain the workforce's economic relevancy.

Access to Information

All information collected from you during the course of the research project will be strictly confidential, unless specified otherwise. Only the researcher's team will have access to the information; alongside Curtin University's Human Research Ethics Committee (HREC) for monitoring purposes.

The data collected in this research project will be kept under secure conditions at Curtin University (electronic data will be password-protected while physical copies will be kept in a locked cabinet) for seven (7) years after the research project is completed. Thereafter, all data collected will be destroyed.

Data collected **may** be shared in an anonymised form to allow reuse by the research team or the copyright owner of an instrument used in this research project. Similarly, you will not be identified nor identifiable in the anonymised data.

Results of the Research

You may obtain the full results through journal publications or conference papers, if any.

Consent Process

Upon deciding to participate in this research project, you will find a tick box at the beginning of the survey form. By ticking off, you are indicating that you have understood the information provided in this information sheet. You are also indicating your consent to participate and providing permission for the research team to collect your information and use it as described.

What am I Required to Do?

You will be presented with a set of questions. You should spend approximately 15-20 minutes to complete the survey form. Please note that the rating scale may differ from section to section. Therefore, do read carefully prior to answering the questions.

Thank you for reading.

For enquiries, please contact Ting Qian Hui at qianhui.ting@postgrad.curtin.edu.my.

Consent Form

HREC Project Number:	HRE2019-0571
Project Title:	The Role of Psychological Capital and Employee Engagement in Determining Organisational Citizenship Behaviour in the Industrial Revolution 4.0 Era: Transfer of Training as a Mediator
Chief Investigator:	Associate Professor Goi Chai Lee
Student researcher:	Ting Qian Hui
Version Number:	1
Version Date:	3 July 2019

Please read the following and tick the tick box provided if you agree.

- I have read the information statement provided and I understand its contents,
- I believe I understand the purpose, extent and procedures of my involvement in this project,
- I have had an opportunity to ask questions and I am satisfied with the answers I have received, and
- I understand that this project has been approved by Curtin University Human Research Ethics Committee and will be carried out in line with the National Statement on Ethical Conduct in Human Research (2007).

Therefore:

I voluntarily consent to take part in this research project.

1. Please indicate if you have attended any training or courses related to Industrial Revolution 4.0 (example: digital upskilling, vocational, technical, soft-skills).

- Yes No

2. Please indicate which of the following best specifies the area you are trained under.

- | | |
|---|--|
| <input type="checkbox"/> Internet of Things (IoT) | <input type="checkbox"/> Additive Manufacturing |
| <input type="checkbox"/> Big Data Analytics | <input type="checkbox"/> Advanced Materials |
| <input type="checkbox"/> Artificial Intelligence | <input type="checkbox"/> Augmented Reality |
| <input type="checkbox"/> Cloud Computing | <input type="checkbox"/> Autonomous Robots |
| <input type="checkbox"/> Simulation | <input type="checkbox"/> System Integration |
| <input type="checkbox"/> Vertical Integration | <input type="checkbox"/> Blockchain Business Model |
| <input type="checkbox"/> Cybersecurity | <input type="checkbox"/> Soft-Skills |
| <input type="checkbox"/> Technical and Vocational Educational Training (TVET) | <input type="checkbox"/> Others (Please Specify) _____ |

3. Please indicate the duration since completing your training, course, or curriculum related to Industrial Revolution 4.0.

- | | |
|---|---|
| <input type="checkbox"/> Three (3) months or less | <input type="checkbox"/> Four (4) to six (6) months |
| <input type="checkbox"/> Seven (7) to nine (9) months | <input type="checkbox"/> Ten (10) to twelve (12) months |
| <input type="checkbox"/> More than one (1) year. | |

4. Please indicate if you are aged between 15-39 years old.

- Yes No

5. If yes, please indicate the age group which you belong to.

- 15-17 18-19
 20-24 25-29
 30-34 25-39

6. Please indicate if you are working in Sarawak.

- Yes No

7. Which of the following best indicates the sector you are employed under?

- Manufacturing Financial Services
 Services (excluding financial services) Information and Technology
 Oil and Gas (Downstream) Oil and Gas (Upstream)
 Construction Mining and Quarrying
 Agriculture, Forestry, and Fishing Tourism
 Education and Training Human Health
 Administrative and Support Service Activities Professional, Scientific, and Technical Activities
 Others (Please Specify)
-

Below are statements that describe how you may think about yourself right now. Use the following scale to indicate your level of agreement or disagreement with each statement.

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6

I feel confident analysing a long-term problem to find a solution.	1	2	3	4	5	6
I feel confident in representing my work area in meetings with management.	1	2	3	4	5	6
I feel confident contributing to discussions about the organization's strategy.	1	2	3	4	5	6
I feel confident helping to set targets/goals in my work area.	1	2	3	4	5	6
I feel confident contacting people outside the organisation (e.g., suppliers, customers) to discuss problems.	1	2	3	4	5	6
I feel confident presenting information to a group of colleagues.	1	2	3	4	5	6
If I should find myself in a jam at work, I could think of many ways to get out of it.	1	2	3	4	5	6
At the present time, I am energetically pursuing my work goals.	1	2	3	4	5	6
There are lots of ways around any problem.	1	2	3	4	5	6
Right now I see myself as being pretty successful at work.	1	2	3	4	5	6
I can think of many ways to reach my current work goals.	1	2	3	4	5	6
At this time, I am meeting the work goals that I have set for myself.	1	2	3	4	5	6
When I have a setback at work, I have trouble recovering from it, moving on.	1	2	3	4	5	6
I usually manage difficulties one way or another at work.	1	2	3	4	5	6
I can be "on my own," so to speak, at work if I have to.	1	2	3	4	5	6

I usually take stressful things at work in stride.	1	2	3	4	5	6
I can get through difficult times at work because I've experienced difficulty before.	1	2	3	4	5	6
I feel I can handle many things at a time at this job.	1	2	3	4	5	6
When things are uncertain for me at work, I usually expect the best.	1	2	3	4	5	6
If something can go wrong for me work-wise, it will.	1	2	3	4	5	6
I always look on the bright side of things regarding my job.	1	2	3	4	5	6
I'm optimistic about what will happen to me in the future as it pertains to work.	1	2	3	4	5	6
In this job, things never work out the way I want them to.	1	2	3	4	5	6
I approach this job as if "every cloud has a silver lining".	1	2	3	4	5	6
Overall, I possess psychological resources that facilitates goal achievement.	1	2	3	4	5	6

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The following are statements about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. Use the following scale to indicate how frequently you feel that way.

Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Everyday
0	1	2	3	4	5	6

At my work, I feel bursting with energy.	0	1	2	3	4	5	6
At my job, I feel strong and vigorous.	0	1	2	3	4	5	6
When I get up in the morning, I feel like going to work.	0	1	2	3	4	5	6
I am enthusiastic about my job.	0	1	2	3	4	5	6
I am proud of the work that I do.	0	1	2	3	4	5	6
My job inspires me.	0	1	2	3	4	5	6
I am immersed in my work.	0	1	2	3	4	5	6
I get carried away when I'm working.	0	1	2	3	4	5	6
I feel happy when I am working intensely.	0	1	2	3	4	5	6
Overall, I am engaged in my job.	0	1	2	3	4	5	6

Knowledge, skills, and attitude encompassing technical, methodological, social, and personal dimensions constitutes digital competencies which you may apply at work after attending training. Use the following scale to indicate your level of agreement or disagreement with each of the following statement.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

I use digital technology to improve work performance.	1	2	3	4	5
I actively explore emerging digital technologies.	1	2	3	4	5
I practice cybersecurity to protect my organisation's stakeholders' information (e.g. personal data, trade information).	1	2	3	4	5
I use digital technology to express my creativity.	1	2	3	4	5
I can identify problems at work accurately using digital technology.	1	2	3	4	5
I am able to make decisions based on digital information.	1	2	3	4	5
I am able to communicate with others effectively in digital environments.	1	2	3	4	5
I am able to collaborate with others effectively in digital environments.	1	2	3	4	5
I am able to share knowledge with others effectively in digital environments.	1	2	3	4	5
I am aware of ethical issues on the use of digital contents.	1	2	3	4	5
I am open-minded towards new developments in the digital environment.	1	2	3	4	5
I believe digital technologies complement human capital to benefit my organisation.	1	2	3	4	5
Overall, training encouraged me to be digitally competent at work.	1	2	3	4	5

DEMOGRAPHICS

1. Please indicate your gender.

- Male Female

2. Please indicate the highest level of your education.

- Doctorate Degree Master's Degree
 Bachelor's Degree Diploma / STPM
 SPM Others

3. Which of the following most closely matches your position level?

- Entry Level Executive / Associate
 Manager Senior Manager
 Director Chief Officer
 President Owner

4. Please indicate the nature of your employing organisation.

- Privately-Owned Firm Government-Owned Firm

5. Please indicate the unit you are serving under.

- Headquarters Branch

The following statements represent behaviours that you may exhibit at the workplace. Please read each statement carefully and decide if you

ever engaged in such behaviour. Use the following scale to indicate how frequently you behaved in such manner.

Never	Almost Never	Rarely	Sometimes	Often	Very Often	Always
1	2	3	4	5	6	7

I willingly give my time to help others who have work-related problems.	1	2	3	4	5	6	7
I adjust my work schedule to accommodate other employees' requests for time off.	1	2	3	4	5	6	7
I give up time to help others who have work or non-work problems.	1	2	3	4	5	6	7
I assist others with their duties.	1	2	3	4	5	6	7
I attend functions that are not required but that help the organisational image.	1	2	3	4	5	6	7
I defend my organisation when other employees criticize it.	1	2	3	4	5	6	7
I offer ideas to improve the functioning of my organisation.	1	2	3	4	5	6	7
I take action to protect the organisation from potential problems.	1	2	3	4	5	6	7
Overall, I proactively engage in extra-role behaviour.	1	2	3	4	5	6	7

Thank you for participating in this research study.

Your responses are highly appreciated.

For further enquires, kindly email qianhui.ting@postgrad.curtin.edu.my

Appendix B- Ethics Office Approval



Research Office at Curtin

GPO Box U1967
Perth Western Australia 6845

Telephone +61 8 9206 7863
Facsimile +61 8 9206 3793
Web research.curtin.edu.au

27-Aug-2019

Name: Ooi Chai Lee Ooi
Department/School: School of Management
Email: Chai.lee.Ooi@chc.curtin.edu.au

Dear Ooi Chai Lee Ooi

RE: **Ethics Office approval**
Approval number: HRE2019-0571

Thank you for submitting your application to the Human Research Ethics Office for the project **The Role of Psychological Capital and Employee Engagement in Determining Organisational Citizenship Behaviour in the Industrial Revolution 4.0 Eric Transfer of Training as a Mediator**.

Your application was reviewed through the Curtin University Negligible risk review process.

The review outcome is: **Approved**

Your proposal meets the requirements described in the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*.

Approval is granted for a period of one year from **27-Aug-2019** to **26-Aug-2020**. Continuation of approval will be granted on an annual basis following submission of an annual report.

Personnel authorised to work on this project:

Name	Role
Ting, Qian Hai	Student
Ooi, Ooi Chai Lee	Supervisor
Lew, Yek Yew	Supervisor
Siri, Adrial	Supervisor

Approved documents:

Document

Standard conditions of approval

1. Research must be conducted according to the approved proposal
2. Report in a timely manner anything that might warrant review of ethical approval of the project including:
 - proposed changes to the approved proposal or conduct of the study
 - unanticipated problems that might affect continued ethical acceptability of the project
 - major deviations from the approved proposal and/or regulatory guidelines
 - serious adverse events
3. Amendments to the proposal must be approved by the Human Research Ethics Office before they are implemented (except where an

Appendix C- Permission to Reuse PCQ Instrument

Qian Hui Ting



To whom it may concern,

This letter is to grant permission for Qian Hui Ting to use the following copyright material:

Instrument: *Psychological Capital (PsyCap) Questionnaire (PCQ)*

Authors: *Fred Luthans, Bruce J. Avolio & James B. Avey.*

Copyright: "Copyright © 2007 *Psychological Capital (PsyCap) Questionnaire (PCQ)* Fred L. Luthans, Bruce J. Avolio & James B. Avey. All rights reserved in all medium."

for his/her thesis/dissertation research.

Three sample items from this instrument may be reproduced for inclusion in a proposal, thesis, or dissertation.


The entire instrument may not be included or reproduced at any time in any other published material.

Sincerely,

A handwritten signature in black ink, appearing to read "K. H. Ting".

Mind Garden, Inc.
www.mindgarden.com

Appendix D- Permission to Reuse UWES-9 Instrument



Wilmar Schaufeli
Professor at Utrecht and Leuven
University

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- RESEARCH >
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Notice for potential users of the UWES and the DUWAS

You are welcomed to use both tests provided that you agree to the following two conditions:

1. The use is for non-commercial educational or research purposes only. This means that no one is charging anyone a fee.
2. You agree to share some of your data, detailed below, with the authors. We will add these data to our international database and use them only for the purpose of further validating the UWES (e.g., updating norms, assessing cross-national equivalences).

Data to be shared:

For each sample, the raw test-scores, age, gender, and (if available) occupation. Please adhere to the original answering format and sequential order of the items.

For each sample a brief narrative description of its size, occupation(s) covered, language, and country.

Please send data to: w.schaufeli@uu.nl. Preferably the raw data file should be in SPSS or EXCEL format.

Accept and continue to the test forms

Appendix E- Permission to Reuse Lee and Allen's (2002) OCB Questionnaire

From: Kibeom Lee <kibeom@ucalgary.ca>

Sent: 10 June 2019 19:19

To: Qian Hui Ting

Subject: RE: Permission to Use Organisational Citizenship Behaviour Survey Items.

Dear Ting Qian Hui:

Thank you for your interest in our study. The scale was published and you can use it in any way you want.

Good luck with your research.

Best regards,
Kibeom

From: Qian Hui Ting <qianhui.ting@postgrad.curtin.edu.au>

Sent: Sunday, June 09, 2019 10:16 PM

To: Kibeom Lee <kibeom@ucalgary.ca>

Subject: Permission to Use Organisational Citizenship Behaviour Survey Items.

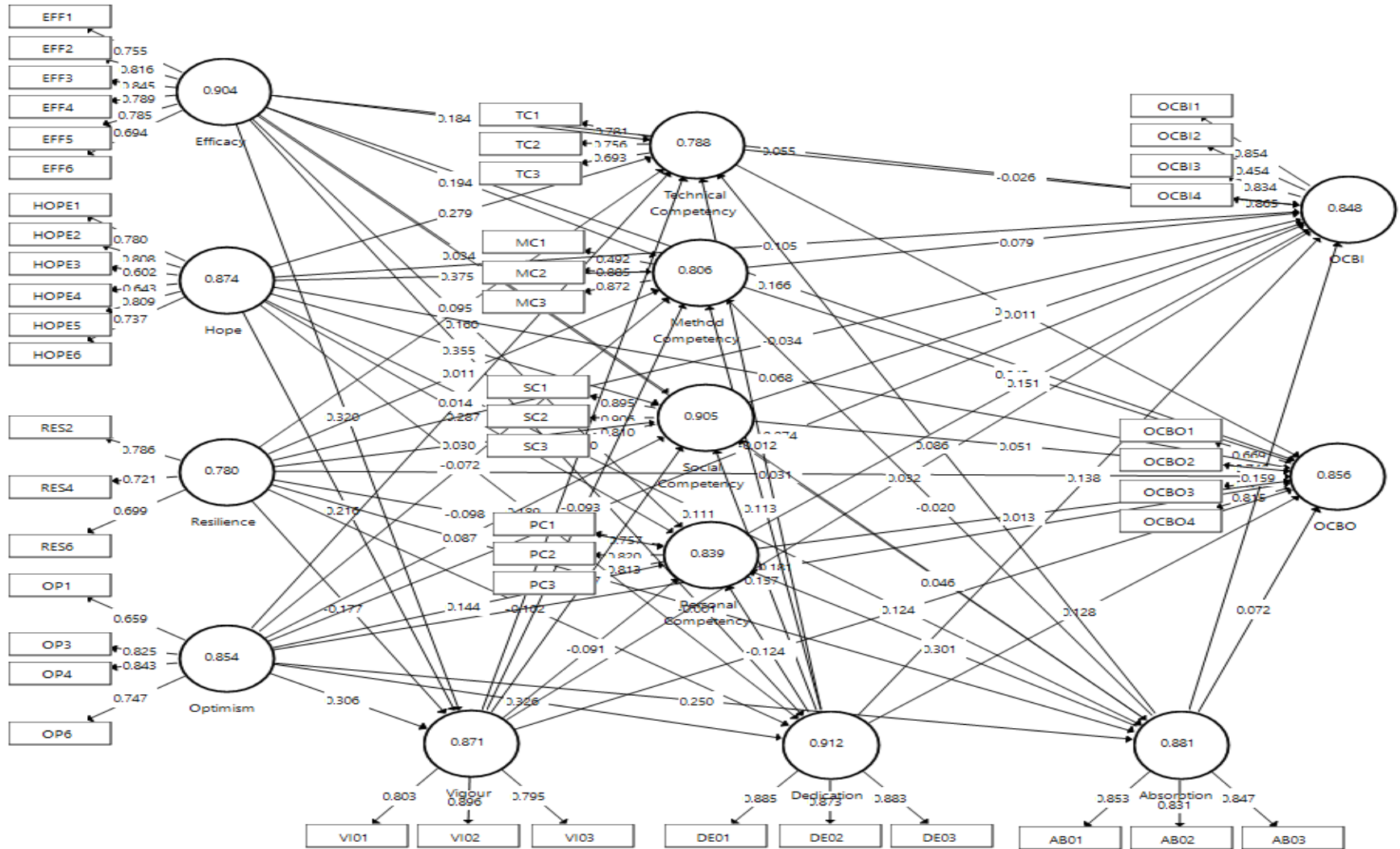
Warmest greetings, Professor Lee.

My name is Ting Qian Hui, a master's student from Curtin University. I am currently writing my dissertation entitled: "The Role of Psychological Capital and Employee Engagement in Determining Organisational Citizenship Behaviour in the Industrial Revolution 4.0 Era: Transfer of Training as a Mediator", under the supervision of my thesis committee chaired by Dr. Shamsul Kamariah Abdullah.

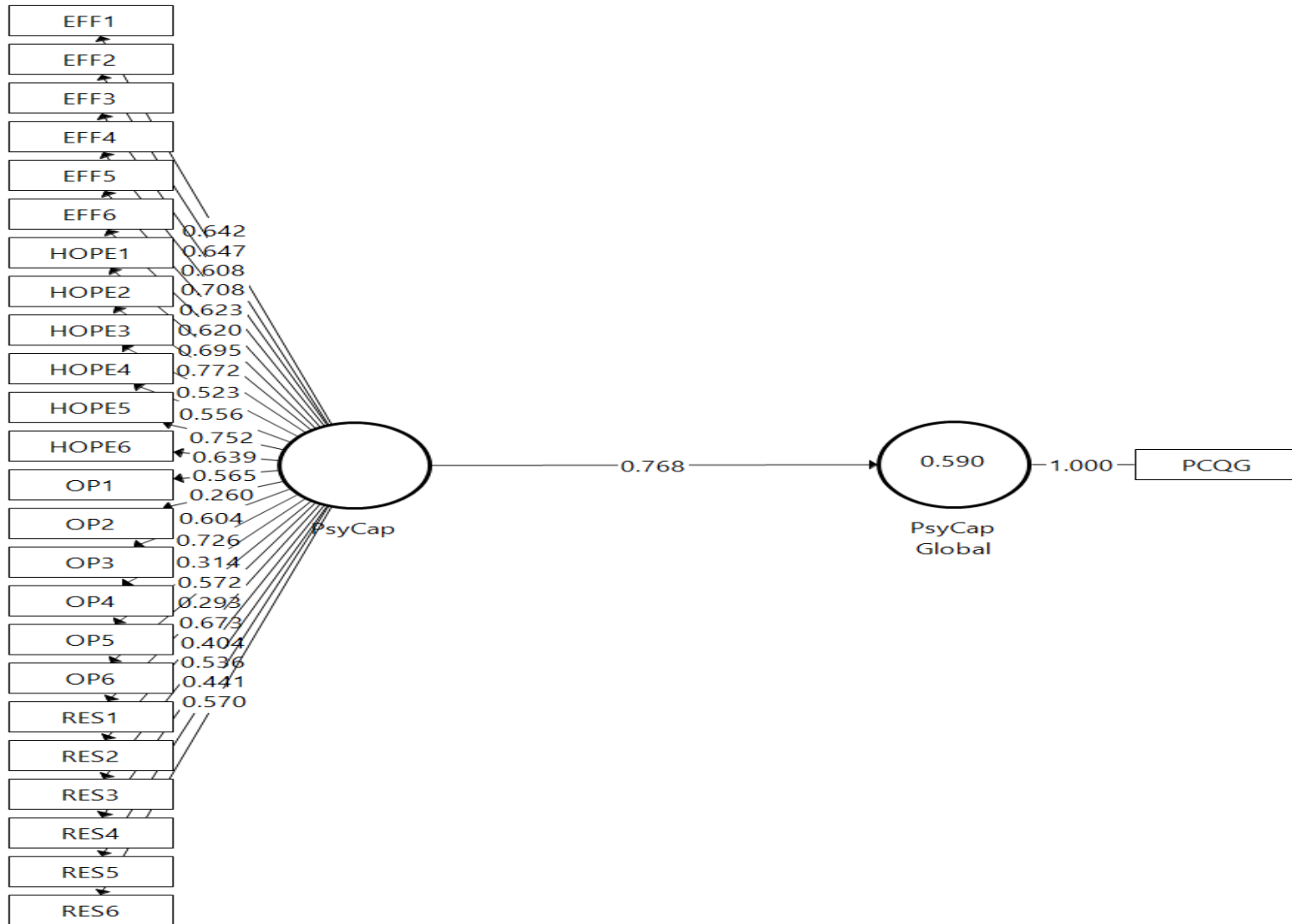
I would like to seek your permission to use the Organisational Citizenship Behaviour survey items. These survey items refer to those in your 2002 paper (in collaboration with Dr. Natalie J. Allen), which was published in the Journal of Applied Psychology, entitled: "Organizational Citizenship Behavior and Workplace Deviance: The Role of Affect and Cognitions." I would like to reproduce your survey items based on the following conditions:

- I will use the surveys solely for research and will not sell or use it for commercial purposes.

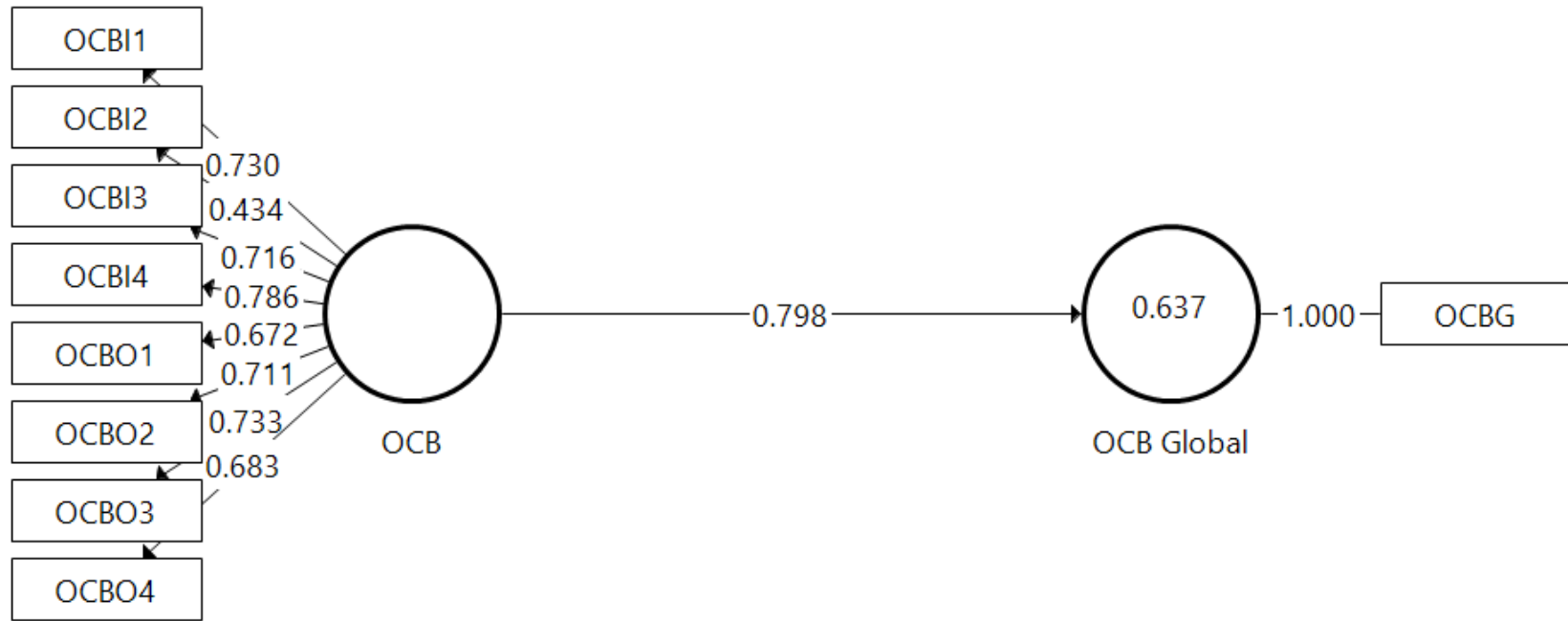
Appendix F- Measurement Model after Removal of Items



Appendix G- Redundancy Analysis of Psychological Capital



Appendix H- Redundancy Analysis of Organisational Citizenship Behaviour



End of Thesis