

DIRTY, DANGEROUS, AND DIFFICULT SECTORS: CHALLENGES, OPPORTUNITIES AND WAY FORWARD

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ABSTRACT

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This article aims to offer a broad perspective on the factors contributing to Malaysians' hesitancy to pursue employment in the 3D sectors. It achieves this by emphasizing crucial factors that contribute to this problem, thus identifying potential and feasible solutions. This article proposes practical solutions that aim to improve employers' compliance with human rights in order to attract more Malaysian workers. Improving working conditions could potentially help reduce reliance on foreign workers in the future.

Keywords:

3D Sector; Challenges;
Employment;
Opportunities.

1.0 Introduction

The acronym 3D stands for dirty, dangerous, and difficult. The term "3D sector" generally related to employment across a range of industries, including automotive servicing, building, factory work, farming, cultivation, and cleaning services (Ahmad et al., 2019). Zulkiflee, Puteh, and Ahmad (2020) characterise the '3D' industries as dirty, dangerous, and difficult sectors that require significant labor input, provide risky work environments, and pays inadequately. Extremely few Malaysians decide to work in these sectors because of the widespread negative stereotypes that these careers hold. The Malaysian Employers Federation (MEF) claims that individuals in Malaysia generally refrain from engaging in manual labor-intensive industries or sectors such as agriculture, not due to the inadequate pay but rather because of the societal perception that such occupations do not have status. Undoubtedly, the lack of local labor to occupy 3D positions is attributable to companies' reluctance to increase wages and enhance working conditions in an effort to reduce expenses (Mohamad et al., 2021).

Indeed, according to the research conducted by Zulkiflee, Puteh, and Ahmad (2020), Malaysia relies on millions of foreign labourers to occupy positions in the construction, manufacturing, goods or services, and agriculture sectors, which are classified as "dirty, dangerous, and difficult" ('3D') (Ministry of Human Resources (MOHR), 2020). To reposition the 3D, it is essential that the government or any industry engaged in the process invest in high-quality safety equipment, training, and protocols to mitigate hazards and safeguard the welfare of workers. An extensive reorganization of the 3D industry is required, with particular attention to ensuring equitable wages, access to healthcare, and insurance coverage for high-risk occupations (New Straits Times, 2022). In addition to this, the facilities and equipment needs to be modernised in order to produce a working environment that is both more comfortable and more productive. As a result, one of the actions that the government might take as part of its efforts to grow the 3D industry in the country and give employment opportunities for the young people of the country is to offer better wages (Fateh et al., 2020). As a country that is still in the process of developing, the unfavorable perception of the 3D industry needs to be changed. There will be major challenges for the nation if these employment are not developed. In this context, these industries are sometimes seen as dirty, dangerous, and difficult jobs for local youth to apply as a career. The following sections offer extensive discussion on (i) Dirty, Dangerous, Difficult (3D) Sectors, (ii) Opportunities of 3D sectors, (iii) Challenges of 3D sectors and also (iv) Feasible solutions are also put forward to be considered by respective stakeholders.

2.0 Dirty, Dangerous, And Difficult Sectors

The 3D (dirty, dangerous, and difficult) sectors, such as manufacturing, construction, services, mining, and quarrying, accounted for the majority of economic growth and offered many job opportunities for the country's workforce (International Organization for Migration, 2023). However, Malaysians find 3D companies less appealing to avoid them, especially among the younger Generation Y workforce (Zahari & Puteh, 2022). The negative perception of the construction sector, which has traditionally been linked to filth, difficulty, and risk, has indirectly deterred many workers from pursuing careers in the field (Alshahrani et al., 2023). "3D jobs"—a term used to refer to employment that combine dangerous, dirty, and difficult qualities—are jobs that combine these negative aspects. According to Wijayaningtyas et al., (2022) dirty can be define as occupations like mechanics, garbage collectors, and sewer workers. While, Barker & Jewitt (2022) stated dangerous is the possibility of direct interaction with industrial processes and substances that endanger the health of workers is the foundation for the use of dirty and dangerous materials. Then, Mahmood et al., (2021) claim that dangerous involve a high risk of injury or illness. This could be due to working with hazardous materials, operating heavy machinery, or being exposed to extreme weather conditions. Examples include firefighters, oil rig workers, and roofers.

3.0 Opportunities.

3.1 Provide employment in a variety of economic sectors for Malaysia's youth workforce.

In order to provide employment opportunities for youth, the government and all industries involved in the 3D rebranding were obligated to invest in high-quality protective equipment, education and training, and procedures to minimise risks and assure worker well-

being. In fact, in order to lessen reliance on foreign labour, the Ministry of Human Resources (MOHR) intends to transform the dirty, dangerous, and difficult (3D) sector into high-paying employment opportunities (Business Today, 2023). Thus, local students can be provided with employment opportunities and will encourage youth in the area to pursue careers in the 3D industry. According to Nikki (2020), better compensation and improved working conditions would probably draw in local workers to fill the job positions without any issues. It would be beneficial for the government to provide incentives to encourage employers to hire more local workers instead of relying on foreign labour. Providing full-time 3D jobs with benefits like EPF contributions, Socso protection, medical coverage, accommodation, and other perks can be a great way to attract more local youth to the 3D sector (Nikki, 2020).

With a focus on technology, the sectors involved are making progress towards transforming the 3D sector to enhance safety, efficiency, and sustainability. By utilizing these methods, the digitalization of the construction industry becomes more attractive to recent graduates as it challenges the conventional perception of construction work as dirty, dangerous, and difficult (Elrefaey, 2023). According to Geza, et al., (2021), the idea of making agriculture more profitable and less laborious has the potential to attract young people to the field of agriculture. With the advancement of technology in the 3D sector, it will aim to attract students who are currently studying agricultural science degrees, as well as those from other fields with comparable skills and interests. In line with Yoon, et al., (2021), the growth of agricultural industry plays a crucial role in attracting young individuals, such as high school and undergraduate students, and motivating them to overcome the misconception that farming does not have innovation and is only occurs in rural areas. This encourages them to consider pursuing careers in farming. Given the circumstances, the successful rebranding of 3D industries presents promising prospects for young individuals to take on more responsibilities in their career.

3.2 Promote Malaysia's Economic Growth.

Both the government and companies involved in the reshaping of the 3D sector are obliged to improve the working environment and production efficiency. Reshaping the 3D sector can provide an effective impetus for economic growth. Generally speaking, those involved in the 3D sector are generally basic industrial sectors, such as ore mining, chemical industry, steel smelting, and construction industries. The degree of development of these basic industries determines the top line of national economic development. These are the most basic and closely related to our lives, such as the development of cars, buildings, and technology. Therefore, we need to ensure that there are enough employees to engage in 3D-related industries, but because the 3D industry is more harmful to the body (Bobbe, M., et al. 2022) and is not as decent as other jobs. Therefore, in reshaping the 3D sector, we must first improve the health and safety level of workers, which can reduce medical costs and labor loss, reduce production interruptions and human resource losses caused by work-related accidents and occupational diseases, thereby improving production efficiency and economic benefits. Secondly, improve health facilities and services (Zhao Bin, Wang Li, 2019). Because this kind of 3D sector usually has its own employee community, improving the health facilities in the community can improve the quality of life of community residents, promote the increase in consumer demand, stimulate the development of related industries, and then promote the economy increase. Moreover, the purchase of medical equipment is equivalent to promoting the development of related enterprises in disguise. In addition, reshaping the 3D sector can also create more job opportunities, especially for those who have limited employment opportunities in traditional industries, such as low-skilled labor and rural residents. Increasing employment

opportunities can not only increase personal income levels, but also promote the growth of consumption and investment and promote sustainable economic development. Therefore, by fully leveraging the social opportunities associated with the health action framework, reinventing the 3D sector can make an important contribution to economic growth and achieve sustainable economic development and prosperity.

Reshaping the 3D department can also promote social equity, because most employees working in the 3D department are relatively disadvantaged groups in society. In this process, the government and relevant enterprises can take a series of measures to promote equitable and inclusive development at all levels of society. First of all, reshaping the 3D sector needs to focus on providing equal employment opportunities. Regardless of technical level or social status, everyone should have the opportunity to participate in the production process. This means eliminating discrimination and ensuring that everyone has a fair chance at employment based on their ability and willingness. Secondly, reinventing the 3D sector can reduce socioeconomic gaps by providing good working conditions and benefits. This includes measures such as raising wage levels, improving labor conditions, and providing medical insurance and pensions to ensure that every worker can enjoy basic social security and benefits (Yang Tao, 2021). In addition, reinventing the 3D sector can also enhance the competitiveness of disadvantaged groups through skills training and education improvement programs. This will help improve their employability and social status, reduce poverty and social exclusion, and promote overall social fairness and stability. Finally, the government should work with schools to start with education, so that the public no longer thinks that working in the 3D industry is inferior to others. The work we all engage in is an indispensable part of society, and we are all working hard for national development. We should not be discriminated against because of our jobs. In summary, through opportunities related to the health action framework, reshaping the 3D sector can promote social equity and make positive contributions to the harmonious stability and sustainable development of society.

3.3 Robust The Opportunity in Guarantee Better Living by Improving Competitive Wages.

The 3D sectors were at times has commonly narrates it as dangerous, dirty and difficult jobs that has subsequently highly contributed to Malaysian economy (Achim, 2020). Over the years, this sectors have heavily reliance on foreign workers whilst several efforts have been done to call-out the locals to fill the demands in this sector (Bernama, 2021). In light of the government drill in bring to a halt of foreign workers' influx into 3D sectors, the government urged to guarantee the career development to the workers that has facilitate into this sector group by offering them a comfortable income. (New Straits Times, 2022).

According to Dongson (2024), in a perspective of employment, competitive wages refers to a compensation that deem suitable or above the industry standard. Career development refers to the progression to achieve the long term professional growth that the organization has to offer and provide to their workers and this often involves skills development, networking and career pathing. In concomitance with leveraging the involvement of the local workers, the government also has determined the ceiling for foreign workers at only 15% of the total workforce in 3D sectors (The Star, 2024). Aligned with numerous of offers that the government has considered and the ceiling set up has opened up the local's opportunity to taking up 3D jobs due to the desire of the youth today is career development. In realizing the reality that the people are much far concerned on their development growth, the government has further in March 2023, has imposed a stop hiring on foreign workers that aimed

to reduce the numbers of reliance on the foreign workers next to shift the focus on lifting the 3D sectors to the local workers (Vethasalam, 2024). The government then has further projecting the effort by revitalizes this sector into high income jobs in future (The Star, 2023).

These policies were assuredly being made to rebrand the 3D sectors to the professional level towards the local workers particularly for the youth in pursuing their career in this sector. Far importantly there are numbers of training that already existed that expose the people (locals) to the 3D scope of works such as Construction Industry Transformation Plan (CITP) and the implementation of Skim Latihan 1 Malaysia (SL1M) programme in regulate and produce better skilled workers' intake.

4.0 Challenges

4.1 Limited Local Acceptance and Awareness.

It is obvious that many employers in Malaysia make the switch to hiring foreign workers due to the lack of interest among Malaysians in taking up 'dirty, dangerous and difficult' (3D's) jobs. This is because the majority of local and young employees tend to prioritize receiving fair wages and are often refusing to work in poor and challenging environments. According to Said (2022), migrant workers tend to be more willing to accept jobs with higher levels of risk due to the number of these opportunities. Additionally, they typically earn lower incomes and have little wealth compared to local residents. According to the Malaysian Employers Federation (MEF), some believe that the reason Malaysians avoid 3D (dangerous, dirty, and difficult) jobs is not because of the salary, but rather due to the lack of social acceptance (Loo, 2020). Many local decline job offers in industries that are considered dangerous, dirty, and difficult, not necessarily due to the low salaries, but rather because these jobs are often seen as undervalued or difficult. According to a study conducted by Hassan, Noor, and Mohammad (2021), there are over one million jobs that are considered unattractive due to their challenging nature and the risks involved. These jobs are often referred to as "dirty, dangerous, and difficult" (3D) and can be found in sectors such as manufacturing, mining, and construction. Andiappan et al., (2021) mentioned that the social perception of jobs in the biomass sector is often negative, as they are often seen as dirty, dangerous, and difficult.

Based on a study by Zulkiflee et al., (2020), there is a lack of knowledge and awareness among Malaysian youth regarding '3D' industries. Consequently, the younger generation of Gen Y individuals showed hesitancy towards pursuing careers in industries that involve 3D' industries. This reluctance resulted from misunderstandings and a general lack of awareness about these particular industries (Annuar, 2019). According to a different study, it has been found that a significant number of individuals in the area tend to avoid pursuing career opportunities in the oil palm industry due to their perception of these jobs as being dirty, dangerous, and demanding (Jaffar et al., 2022). These jobs have been impacted by the lack of interest from local individuals and the reliance on migrant workers. This situation has motivated local workers to relocate to other developing nations in order to secure higher wages (Mohamad, et al., 2021). Interventions from various sector are necessary to transform 3D sectors into trustworthy and reasonable career options. It is crucial for the government to ensure strict enforcement of the current laws regarding human rights compliance in the workplace in order to enhance the status for 3D workers. When the number of foreign workers is significantly reduced and local workers are offered better job opportunities and incentives, they would be

more likely to accept these jobs. However, the main challenge involves changing the social stigma associated with the 3D sector.

4.2 Occupational Safety and Health.

In the dirty, dangerous, and difficult (3D) sectors, occupational health and safety issues pose significant challenges. The work environments in these sectors are typically rife with various potential hazards that could pose serious threats to the health and lives of workers. Firstly, workplaces may contain multiple hazards such as chemicals, dust, noise, high temperatures, and high pressure (Wilson, 2019). For instance, in the mining sector, workers may be exposed to harmful gases, chemicals, or dust, increasing the risk of respiratory diseases. Additionally, noise and vibrations can lead to hearing impairment and musculoskeletal disorders. These diseases are often chronic and may continue to afflict individuals even after retirement. Moreover, the high temperatures and pressures within mines can cause heatstroke, burns, and in case of emergencies, the mortality rates among such workers are significantly higher compared to other occupations (Akhtar, et al., 2020).

Then, due to a lack of appropriate personal protective equipment (PPE), workers may face greater health risks. Insufficient or improper use of PPE may expose workers to hazardous substances or environments, increasing the risk of injury or illness. For example, in the construction industry, failure to wear helmets, safety harnesses, and goggles can result in injuries or fatalities during work at heights. Furthermore, 3D sectors often involve heavy physical labor and long working hours, such as in mining, chemical industries, and steel manufacturing. Prolonged exposure to dirty and hazardous environments may lead to physical and psychological fatigue among workers, thereby affecting work efficiency and safety. In such circumstances, workers may experience fatigue, stress, and anxiety, further increasing the risk of work accidents and injuries (Hale, 2020). Moreover, in Malaysia, being a multicultural country, temporary and migrant workers may face additional risks due to language barriers and cultural differences, as they may not fully understand workplace safety regulations and operating procedures, increasing the risk of accidents and injuries.

Addressing occupational health and safety issues in the restructuring of 3D sectors involves multiple facets, including diverse hazards, a lack of appropriate PPE, physical and psychological fatigue from heavy labor and long hours, and specific challenges faced by temporary and migrant workers. Addressing these issues requires comprehensive measures, such as strengthening workplace safety management, providing adequate PPE, improving working conditions and environments, and enhancing worker training and education.

4.3 Dealing with Unconducive Working Environment.

That is undeniable that 3D (dangerous, dirty and difficult) sectors carry a heavy social stigma that often deem undesirable and even bring as a negative example relates to the perceptions on lower education, social status and low salaries. According to (Selan, 2020) the social stigma on this such position (3D) industry was remain unchanged as the perceptions of these job carry a lower social caste in Malaysian surroundings. Not to mention the others challenges that also fuels the resistance is by dealing with the unconducive working environment (H.Rodzi, 2021). According to Akmal, (2020)state that that poor involvement of locals in 3D job sectors are included poor images of construction jobs and poor working condition that they more preferred to working overseas. Hence, workplace environment are vital for every workers (employees) of productivity and well-being. Unconducive working environment can lead and trap the

employees in a stressful situation therefore will face the consequence of low job satisfaction as well as employee turnovers (Luyt, 2023).

Of course each and every industry demands a stable and safe working environment as the organization also should have foreseen the well-fare of the workers. (M.Asad, 2022) has justified that health and safety should be a top priority for any human organization. This has due to any injuries are apparently envitable in the workplace (Ibrahim, 2020). Unfortunately, there is a case that they see the 3D sectors as sometimes neglected. This situation can be seen during the spread of COVID-19 where the lockdown – Movement Control Orders (MCO) take place which seen many sectors was directed to close and all the employees are instructed to remotely work from home takes differ to the group that serve as 3D workers that need to operate with full force when actually they are the ones that more vulnerable to the spread of the disease (Bernama, 2021). As this industry is play an important role in Malaysian economic development, working from home may be impractical as a physical activity must be held at project sites (Pirzadeh, 2021). Out of COVID-19 SOPs implementation, this situation indeed has handed to the perceptions of unfair treatment and high risk measures that the sector needs to take deal. Years over years, the sectors desperately need more workers in facilitating the mega infrastructure projects and catching up the completion date. Based on (Ong, 2024) has stated that the outbreaks of COVID19 has more challenging as the project schedule expected to be on track. The reality hit harder when this sector had no choice but to work while all businesses were closed and people in other sectors were ordered to stay at home.

In considering the risk that they might take, the wages that they have to offer were perpetual in low rates where may not be tantamount to the loads that the workers carried. (K.Kankaran, 2020) in his findings point that 3D workers in this sector are mostly paid miserly minimum wages with no allowance. In addition, the cost of living nowadays has significantly increased and the consecutive economic downturn has caused the expanded demands of livable wages. According to (Kamel, 2020), the perception of Malaysians not taking up 3D sectors due to the social judgments on dirt's works is too good to be true because thousands of Malaysian people work in this 3D sector in Singapore to Australia and South Korea due to the better paid and good working conditions. Furthermore, (Awani, 2024) has reported that 6000 Malaysians were employed in 3D sectors in Singapore merely due to the high pay compared to what Malaysia has to offer.

5.0 Way Forward

Based on the articles we collected, Malaysia has relied on foreign labor for a significant period of time to enhance its economic growth. The economic, political, and socio-cultural factors in Malaysia attract foreign workers from various countries and foster a network of international interactions (Hamzah et. al, 2020). To effectively address and support the rebranding of 3D, it is crucial for any sector to offer appealing facilities, benefits, and allowances in order to attract the interest of local workers. As stated by Yap et al., (2022) by upgrading facilities may greatly increase the safety, cleanliness, and ease of doing tough, hazardous, and dirty jobs in a variety of industries. Typically, jobs involving 3D-related work can be quite challenging and risky. Examples include underwater welding and skyscraper building cleaning (Lochery et al, 2024). When hiring an individual, employers must take into consideration each of these factors, and their pay should align with the dangerous environment and challenges of the job position (Hossain et al., 2020). Even in Malaysia, underpayment is considered a significant problem. As a consequence, in an effort to stimulate the nation's 3D

sector and generate employment opportunities for the country's youth, the government could increase remuneration (Sulaiman et al., 2021).

Reshaping the 3D sector (dirty, dangerous, difficult) refers to the reform and reconstruction of industries with dirty working environments, dangerous factors, and difficult working conditions to improve the safety and comfort of the working environment and promote the health of employees and production efficiency (Zhao yi, 2021). In order to attract more young people to engage in the 3D industry, we must not only ensure the life safety of employees, but also provide more benefits and increase basic wages, (Zhang ming, 2022), because employees engaged in this industry are more harmful to the body and work. The content is also more strenuous, and the social status is relatively low, such as miners, construction workers, and high-altitude workers. The working environment and the degree of danger after an accident must be considered in terms of salary positioning, and risks and benefits must coexist (Tam, et al. 2021). In addition, reshaping the 3D department also involves the education of students, fundamentally solving the discrimination against 3D-related workers, and allowing employees engaged in related work to have a fair and reasonable social status. This makes more young people willing to join the 3D industry and contribute to the country's basic industries.

In the efforts to rebrand this sector is also be included all the external factors by way of improving the identity of 3D works itself as societal stigma has been oftentimes threatened this occupations (Mejia, 2020) . This kind of perceptions apparently has develop a low self-esteem and sinking even lower as the years passed. According to (Parkaran, 2020) to start planting a seed in viewing these sector towards a favourable and positive view is to treat them with respect for instance by provided a proper professional uniform to elevate the perceptions of the many. Nonetheless, rebranding the name of the 3D itself is vital to stop the misconception of the 3D industry as dirt career.

6.0 Conclusion

Based on the above information, we can see that the 3D industry in Malaysia has long relied on foreign workers to maintain the development of the industry. Malaysia attracts foreign workers from various countries through economic, political and socio-cultural factors, and promotes the international interaction network form. To effectively respond to and support the repositioning of the 3D industry, various sectors must offer attractive facilities, benefits and perks to attract the interest of local workers. Typical 3D related jobs are often challenging and risky, such as mining development and construction workers, chemical workers. Employers must take these factors into consideration when recruiting employees, and their compensation should be consistent with the hazardous and challenging nature of the work environment. In Malaysia, insufficient salary in the 3D industry is considered to be a major problem that causes few people to be willing to work in the 3D industry. Therefore, in order to stimulate the development of the country's 3D industry and attract more local youth to find employment in this industry, the government and related enterprises can increase salaries and benefits.

Reshaping the 3D industry (dirty, dangerous, difficult) means reforming and rebuilding industries with dirty working environments, dangerous factors and difficult working conditions to improve the safety and comfort of the working environment and promote employee health and productivity. In order to attract more young people to participate in the 3D industry, we must not only ensure the life safety of employees, but also provide more benefits and increase basic wages, because employees engaged in this industry are more harmful to the body, and the work content is more difficult, society. Relatively low status, such as miners, construction workers and height workers. Therefore, the working environment and the degree of danger

after the accident must be considered in salary positioning, and risks and benefits must coexist. In addition, reshaping the 3D sector also involves the education of students, fundamentally solving the discrimination against 3D-related workers, and allowing employees engaged in related work to have a fair and reasonable social status. This makes more young people willing to join the 3D industry and contribute to the country's basic industries. Just like why many Malaysians go to developed countries such as Singapore and Australia to engage in 3D-related industries, it is because these countries provide employees with higher wages and better benefits, and no one will look down on such practitioners.

In reshaping the 3D industry (dirty, dangerous, and difficult), although we face some challenges, there are also broad development prospects. Through technological innovation, education and training, and cooperative innovation, we can bring new impetus and opportunities to the development of the national economy. What we have to do is to work hard to guide more local workers to participate in the 3D industry and reduce dependence on foreign labor, learn from the experience of reforms in other countries, and at the same time plan plans to achieve targeted changes based on the actual situation in Malaysia. No matter how much planning goes into increasing wages, standard operating procedures to ensure job safety, changing the perception that 3D work is seen as dirty work is crucial not only for people but also for employers. The importance of the word 3D itself must be reflected on to achieve this change so that society no longer looks down upon this work.

7.0 References

- A. Hale,. (2020). "Safety Management: A Comprehensive Approach to Developing a Sustainable System". *CRC Press*.
- Achim, N. R. (2020). The Employment Of Foreign Workers : Issues And Implications Towards Organization Performance. *Business Management Conference (IBMC)*.
- Ahmad, N. M., Supaat, D. I., Wook, I., Tagoranao, M. S., & Rahman, N. A. (2018). Malaysians' Reluctance to Work in Local 3D Sectors: A Preliminary Review. *The Journal of Social Sciences Research*. doi:<https://doi.org/10.32861/jssr.sp4.220.223>
- Akhtar, S., et al. (2020). Occupational health and safety in the mining industry: A systematic review. Retrieved from <https://www.sciencedirect.com/science/article/pii/S014829631200121X>
- Alshahrani, A., Alaboud, N., Leje, M. I., Karban, A., & Altowerq, Z. (2023). Rating The Significance Of The Factors Influencing Shortage Of Skilled Labours For Sustainable Construction: A Perception Of Makkah Construction Practitioner. *Journal of Umm Al-Qura University for Engineering and Architecture*, 13-25. doi:<https://doi.org/10.1007/s43995-023-00013-5>
- Andiappan, V., How, B. S., & Ngan, S. L. (2021). A Perspective on Post-Pandemic Biomass Supply Chains: Opportunities and Challenges for the New Norm. *Process Integration and Optimization for Sustainability*, 1003 - 1010. doi:<https://doi.org/10.1007/s41660-021-00176-5>
- Azril Annuar. (2017, December 05). *Malay Mail*. Retrieved from Uncontrolled influx of foreign workers keeping Malaysians from sleep, study shows:

<https://www.malaymail.com/news/malaysia/2017/12/05/uncontrolled-influx-of-foreign-workers-keeping-malaysians-from-sleep-study/1525441>

- Barker, N., & Jewitt, C. (2022). Filtering Touch: An Ethnography Of Dirt, Danger, And Industrial Robots. *Journal of Contemporary Ethnography*, 103-130. doi:<https://doi.org/10.1177/08912416211026724>
- Bernama. (2021). Malaysia desperately needs more 3D workers in construction sector. Malaysia. *New Straits Times*.
- Bernama. (2021). Need for foreign workers as Malaysians not interested in '3d' sector.
- Bin, Z., & Li, W. (2019). "Analysis of service capabilities of primary medical and health institutions and their social equity.". *"China Health Management"*, 47--50.
- Bobbe, M., et al.,. (2022). Musculoskeletal disorders in the manufacturing industry: A review. Retrieved from <https://www.sciencedirect.com/>
- Chen, T., Wang, W., & Sun, J. (2023). Effects Of Occupational Exposure To Quartz Dust On Lung Health: A Systematic Review And Meta-Analysis. *Chinese Journal Of Occupational Medicine*, 1234-1240.
- Dongson, M. (2024). What is a Competitive Salary? What Does It Mean? Market Recruitment.
- Fateh, M. A., Mohamed, M. R., & Omar, S. A. (2022). The Involvement Of Local Skilled Labour In Malaysia's Construction Industry. *Sec. Construction Management*. doi:<https://doi.org/10.3389/fbuil.2022.861018>
- H.Rodzi, N. (2020). Malaysia faces manpower shortag in critical sectors despite high unemployment rate. . *The Straits Times*.
- Hamzah, I. S., Sarifin, M. R., Aziz, M. S., & Abdullah, M. F. (2020). Malaysia as Attraction of International Foreign Workers. *Journal of Critical Reviews*, 7(8), 8. doi:<http://dx.doi.org/10.31838/jcr.07.07.01>
- Hassan, P. F., Noor, M. S., & Mohammad, H. (2021). Challenges in Education and Training to Develop Malaysian Construction Workforce. *International Journal Of Sustainable Construction Engineering And Technology*, 53-69.
- Hossain, M. A., Zhumabekova, A., Paul, S. C., & Kim, J. R. (2020). A Review Of 3D Printing In Construction And Its Impact On The Labor Market. *Sustainability*. doi:<https://doi.org/10.3390/su12208492>
- Hrmasia. (2018, November 28). *Hrmasia*. Retrieved from Malaysian Youths Will Do 'Dangerous, Dirty, Difficult' Jobs For Higher Pay.: <https://hrmasia.com/malaysian-youths-will-do-dangerous-dirty-difficult-jobs-for-higher-pay/>
- International Organization for Migration. (2023). *Assessment Of Causes And Contributing Factors To Migrant Workers Becoming Undocumented In Malaysia*. Switzerland: International Organization for Migration. Retrieved from <https://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>

- J. R. Wilson. (2019). "Occupational Safety and Health: Fundamental Principles and Philosophies". Wiley.
- Jaffar, M. K., Baharoom, R., Maslani, A. M., Ismail, A., & Mohamed, S. (2022). Predictors Influencing Job Satisfaction among Simpang Renggam Youths towards Willingness to Work in the Oil Palm Plantation of Renggam Estate. *International Journal of Academic Research in Economics and Management and Sciences*, 17 - 28. doi:10.6007/IJAREMS/v11-i2/12989
- Kamel, H. (2020). Only higher wages can induce locals to do 3D jobs. . *The Malaysian Reserve*.
- Li, M., Zhang, H., & Wang, L. (2021). Risk Factors For Construction Workers Lacking Head Protection. *China Production Safety Science And Technology*, 100-105.
- Lochery, E., McNamara, T., & Musonda, J. (2024). Subsidising Extraction: Care At work In Zambia's Copper ,Mines. *Antipode*, 21. doi:<https://doi.org/10.1111/anti.13029>
- Loo, C. (2020, 02 18). *Rebrand 3D Jobs for More Social Acceptance*. Retrieved from The Sun: https://thesun.my/local_news/rebrand-3d-jobs-for-more-social-acceptance-KH2018941
- Luyt, M. (2023, April 10). Unhealthy Work Environments: The Impact on Employees and How to Address Them.
- Mahmood, S., Awang, Z., Kmeil, F. A., & Jakada, A. H. (2021). Participation Of Local Youth Workers In Construction Industry And Strategies For Improvement: A Study In Kelantan And Terengganu. *International Journal of Academic Research in Business and Social Sciences*.
- Mejia, C. (2020). Stigma & Dirty Work: In-group and out-group perceptions of essential service workers during COVID-19. *PubMed Central*. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9998172>
- Ministry of Human Resources. (2020, June 22). *Freeze on Recruitment of Foreign Workers Until year-end, Says Saravanan*. Retrieved from The Star: <https://www.thestar.com.my/news/nation/2020/06/22/freeze-on-recruitment-of-foreign-workers-until-year-end-says-saravanan>
- Mohamad, A., Abd Razak, M., Mohamed, S., Wan Ibrahim, W., Khairul Ariff Noh, M., Nasrul, F., & Hassan, S. (2021). Economic Determinants and Foreign Labour Force: Evidence from Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 11, 1023-1034. doi:10.6007/IJARBSS/v11-i3/8828
- Parkaran, K. (2020, July 17). *Respect 3D workers, raise their wages to a monthly minimum RM2,000.00*. Retrieved from <https://www.dagangnews.com/straight-talk/respect-3d-workers-raise-their-wages-to-a-monthly-minimum-rm2000-372>
- Said, D. S. (2022, November 3). *Time to rebrand 3D sector*. Retrieved from New Straits Times: <https://www.nst.com.my/opinion/letters/2022/11/846283/time-rebrand-3d-sector>
- Star, T. (2023). Ministry aims to revamp 3D sector into high- income jobs.
- Star, T. (2024). No extension of May 31 foreign worker deadline. *The Star*.

- Sulaiman, N., Ismail, R., Saukani, N., & Lelchukaman, B. (2021). Skilled Labour Demand In The Malaysian Construction Sector. *Journal of Sustainability Science and Management*, 236-252. Retrieved from <https://ppsms.umt.edu.my/wp-content/uploads/sites/51/2021/07/18-16.4.pdf>
- Sun, H., Cheng, J., & Wang, W. (2022). Culture Conflict In The Workplace: A Review Of Management Strategies. *Journal Of Management.*, 1234-1256.
- Tam, K. Y., et al. (2021). A bibliometric analysis of occupational safety and health research in the Industry 4.0 era. Retrieved from <https://www.sciencedirect.com/>
- Tao, Y. (2021). "Research on Social Equity in Primary Health Service Utilization". *"China Health Statistics"*, 456-459.
- Times, N. S. (2022). Time to rebrand 3D sectors. *Business Times*.
- Vethasalam, R. (2024). Freeze on foreign workers hiring quota stays for now, says HR Minister.
- Wijayaningtyas, M., Lukiyanto, K., Nursant, E., & Laksana, D. I. (2022). The Effect Of Economical Phenomenon On Informal Construction Workers Earnings Within Covid-19 Pandemic: A Mixed Method Analysis. *Heliyon*. Retrieved from [https://www.cell.com/heliyon/pdf/S2405-8440\(22\)01609-7.pdf](https://www.cell.com/heliyon/pdf/S2405-8440(22)01609-7.pdf)
- Yap, J. B., Lam, C. G., Skitmore, M., & Talebian, N. (2022). Barriers To The Adoption Of New Safety Technologies In Construction: A Developing Country Context. *Journal of Civil Engineering and Management*, 120–133. doi:<https://doi.org/10.3846/jcem.2022.16014>
- Zahari, S. N., & Puteh, F. (2022). Gen Z Workforce And Job-Hopping Intention: A Study Among University Students In Malaysia. *International Journal of Academic Research in Business and Social Sciences.*, 902 – 927. doi:<http://dx.doi.org/10.6007/IJARBS/v13-i1/15540>
- Zulkiflee, E. N., Puteh, F., & Ahmad, J. (2020). Analysing the Awareness of Generation Y Youth on ‘3D’ Industries. *Journal of Administrative Science*, 17, 140 - 155. Retrieved from <https://ir.uitm.edu.my/id/eprint/47375>
- Zulkiflee, E. N., Puteh, F., & Ahmad, J. (2021). Assessing Construct Validity Of Gen Y Acceptance On ‘3d’ Industries And Its Determinant Factors. *E-Proceeding 8th International Conference On Public Policy And Social Science (ICoPS)*. Retrieved from <https://ir.uitm.edu.my/id/eprint/54176/1/54176.pdf>